Closeout Report
for IHSS Group NE-1
(North Firing Range [PAC NW-1505])

Approval received from the U.S. Environmental Protection Agency

June 13, 2005.

Approval letter contained in the Administrative Record.

June 2005

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ENCLOSURE

CD Containing Standardized Real and QC Accelerated Action Data

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ACRONYMS

AL	action level
AR	Administrative Record
ASD	Analytical Services Division
BZ	Buffer Zone
CAD/ROD	Corrective Action Decision/Record of Decision
CD	compact disc
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
cy	cubic yard
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DQA	Data Quality Assessment
DQO	data quality objective
DRT	dirt, rubble and trash
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation
ft	feet or foot
ft^2	square feet or foot
FY	Fiscal Year
HRR	Historical Release Report
IA	Industrial Area
IABZSAP	Industrial Area and Buffer Zone Sampling and Analysis Plan
IASAP	Industrial Area Sampling and Analysis Plan
ICP	inductively coupled plasma
IHSS	Individual Hazardous Substance Site
ISOCS	In-Situ Counting System
K-H	Kaiser-Hill Company, L.L.C.
LCS	laboratory control sample
mg/kg	milligrams per kilogram
MS	matrix spike
MSD	matrix spike duplicate
N/A	not applicable
NFAA	No Further Accelerated Action
NLR	No Longer Representative
PAC	Potential Area of Concern
PARCCS	precision, accuracy, representativeness, completeness, comparability, and sensitivity
PCB	polychlorinated biphenyl
PCOC	potential contaminant of concern

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QC	quality control
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS or Site	Rocky Flats Environmental Technology Site
RI/FS	Remedial Investigation/Feasibility Study
RIN	report identification number
RL	reporting limit
RPD	relative percent difference
RSOP	RFCA Standard Operating Protocol for Routine Soil Remediation
SAP	Sampling and Analysis Plan
SOR	sum of ratios
SSRS	Subsurface Soil Risk Screen
SVOC	semivolatile organic compound
SWD	Soil Water Database
V&V	verification and validation
VOC	volatile organic compound
WRW	wildlife refuge worker
XRF	x-ray fluorescence

EXECUTIVE SUMMARY

This Closeout Report summarizes characterization and accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group NE-1 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. IHSS Group NE-1 consists of the A-, B-, C-Series retention ponds, and the North Firing Range. However, this Closeout Report addresses only the site covered under ER RSOP Notification #05-05 (DOE 2005a), PAC NW-1505, the North Firing Range.

Ponds A-1 through A-4, B-4 and B-5, and C-2, will be addressed via a Data Summary Report (DOE 2005b). Pond C-1 received a No Further Accelerated Action (NFAA) on June 17, 2004 (DOE 2004a) and a separate Closeout Report addresses Ponds B-1, B-2, and B-3 (DOE 2005c).

A total of 61 accelerated action soil characterization locations were sampled in the North Firing Range (PAC NW-1505). Characterization samples were analyzed for metals to determine the areal extent of contamination in the firing range area. Twenty-six sampling locations contained arsenic results, derived via the SW-846 6200 method, greater than the wildlife refuge worker (WRW) action level (AL) of 22.2 milligrams per kilogram (mg/kg). However, through the consultative process it was agreed that the North Firing Range remediation of arsenic WRW AL exceedances analyzed using the SW-846 6200 methodology was not warranted. Arsenic concentrations determined using the SW-846 6200 method (on-site, x-ray fluorescence [XRF]) are up to several orders of magnitude greater than those determined using the SW-846 6010 method (off-site, inductively coupled plasma [ICP] spectrometry) (DOE 2005a).

Three soil sampling locations (BW53-001, BV53-036 and BV53-055) returned surface soil WRW AL exceedances for lead at 3,500, 1,680 and 6,200 mg/kg, respectively. The WRW AL exceedance for lead is 1,000 mg/kg. These three locations were identified for removal in Notification #05-05 (DOE 2005a).

Following excavation of the soil at the three locations, confirmation samples were collected by obtaining surface grab samples at the bottom and on the sideslopes of the excavation. Twenty-three excavation confirmation samples were collected at the North Firing Range. All samples were analyzed via both SW846 6010 (off site) and SW846 6200 (on site) analytical methods.

ER accelerated action activities were conducted between October 26, 2004 and April 11, 2005. Approximately 32 cubic yards (cy) of soil were excavated and disposed from IHSS Group NE-1, North Firing Range (PAC NW-1505). The areal extent of the excavation was approximately 522 square feet (ft^2).

The IHSS Group NE-1, North Firing Range (PAC NW-1505) stewardship evaluation was conducted through ongoing consultation with the regulatory agencies. Frequent informal project updates, e-mails, and telephone and personal contacts occurred throughout the project. Copies of Regulatory Contact Records are provided in Appendix A.

Approval of this Closeout Report constitutes regulatory agency concurrence that IHSS Group NE-1, North Firing Range (PAC NW-1505) is a No Further Accelerated Action

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(NFAA) Site. This information and NFAA determination will be documented in the Fiscal Year (FY) 2005 (05) Annual Update for the Historical Release Report (HRR).

This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record (AR) file. The specific long-term stewardship recommendations will also be summarized in the Rocky Flats Long-Term Stewardship Strategy.

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1.0 INTRODUCTION

This Closeout Report summarizes characterization and accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group NE-1 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. IHSS Group NE-1 consists of the A-, B-, C-Series retention ponds, and the North Firing Range. However, this Closeout Report addresses only the site covered under ER RSOP Notification #05-05 (DOE 2005a), PAC NW-1505, the North Firing Range.

Ponds A-1 through A-4, B-4 and B-5, and C-2, will be addressed via a Data Summary Report (DOE 2005b). Pond C-1 received a No Further Accelerated Action (NFAA) on June 17, 2004 (DOE 2004a) and a separate Closeout Report addresses Ponds B-1, B-2, and B-3 (DOE 2005c). Figure 1 shows the locations of the IHSS Group NE-1 and its respective IHSSs and Figure 2 gives a more detailed look at the North Firing Range.

Accelerated action activities were planned and executed in accordance with the Industrial Area (IA) and Buffer Zone (BZ) Sampling and Analysis Plan (SAP) (IABZSAP) (DOE 2004b) and the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2003). Notification of the planned activities, ER RSOP Notification #05-05 (DOE 2005a), was approved by the United States Environmental Protection Agency (EPA) on March 23, 2005 (EPA 2005).

Ecological risks will be evaluated in the ecological risk assessment portion of the sitewide Comprehensive Risk Assessment (CRA).

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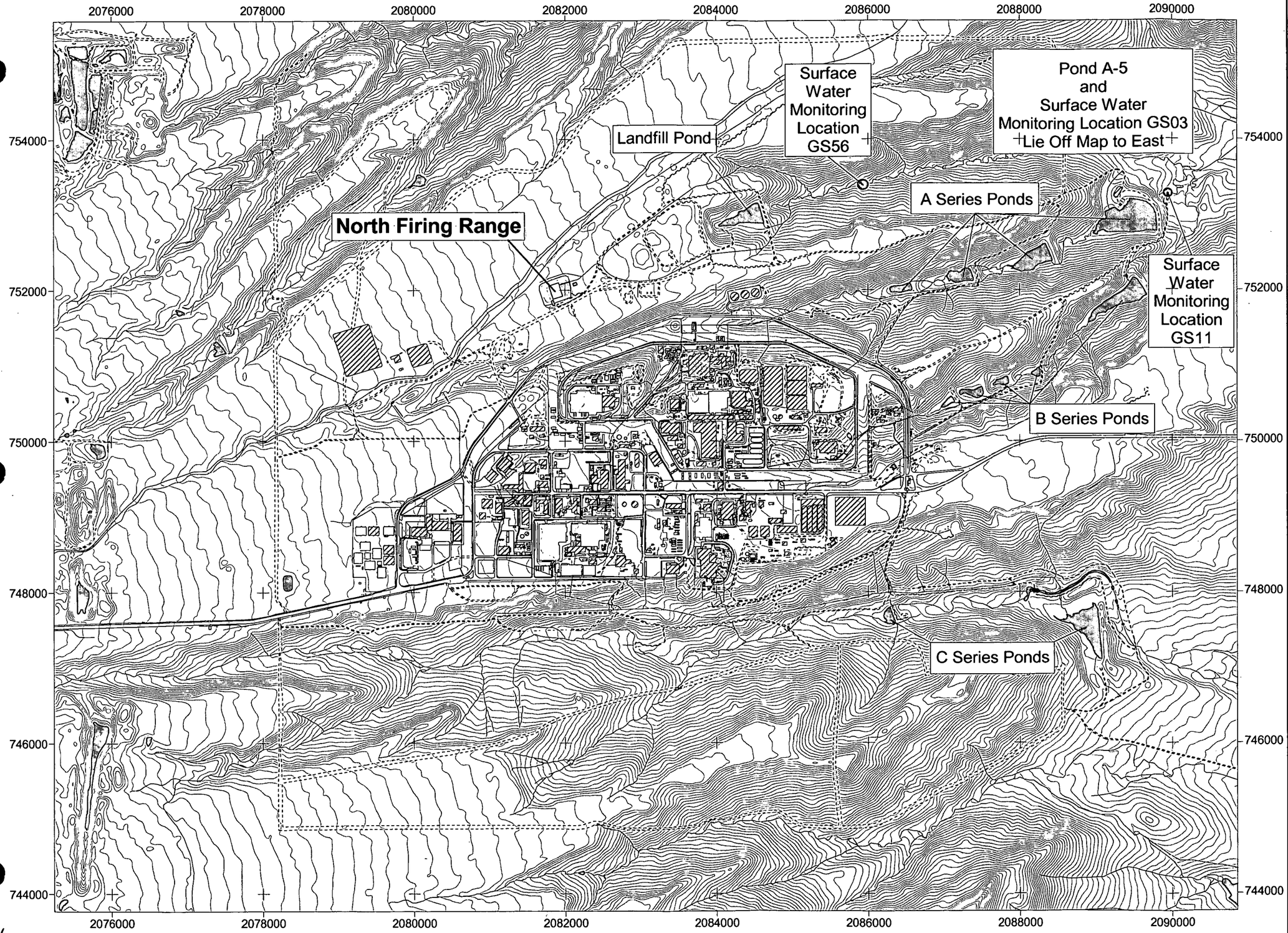
FIGURE 1
IHSS Group NE-1
PAC NW-1505
North Firing Range
General Location



KEY

- Potential Area of Concern (PAC)
- Feature removed from PAC NW-1505
- Building demolished
- Building standing
- Paved road
- Dirt road
- Stream
- Pond
- Topographic contour-5 ft

N
W E
S

500 0 500 1000 1500 2000 Feet

Scale = 1:15000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared for: KAISER•HILL COMPANY

Prepared by: RADMS

File: W/Projects/Fy2005/NE-1_North_Firing_Range/nfr_cor_041305.apr

Date: 4/13/2005

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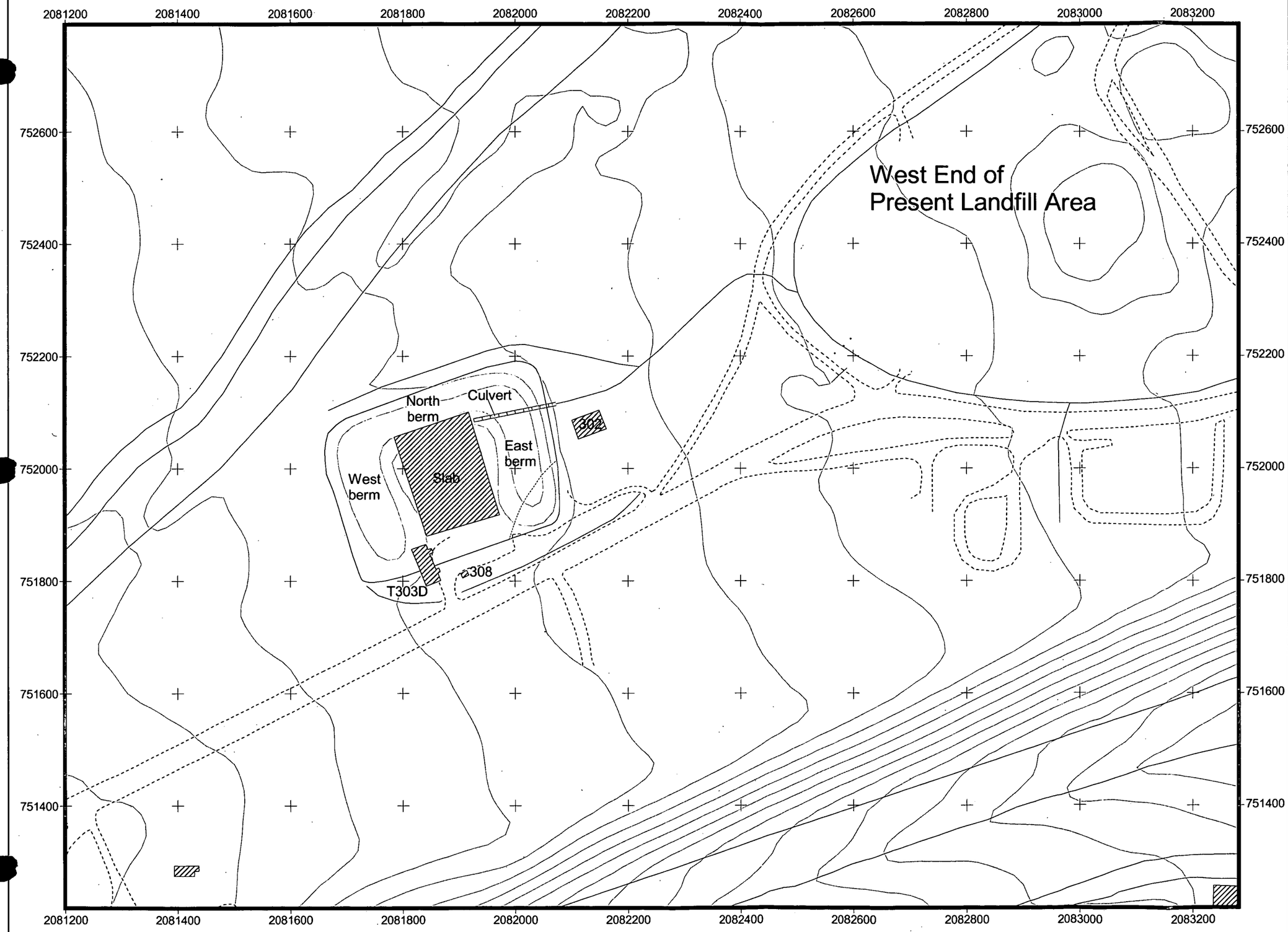
FIGURE 2

IHSS Group NE-1
PAC NW-1505
North Firing Range
Detailed Location



KEY

- Potential Area of Concern (PAC)
- Building or structure removed from PAC NW-1505
- Dirt road
- Stream or ditch
- Topographic contour-5 ft

N
W E
S

50 0 50 100 150 200 250 Feet

Scale = 1:2000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared for: KAISER•HILL COMPANY

Prepared by: RADMS

File: W/Projects/Fy2005/NE-1_North_Firing_Range/nfr_cor_041305.apr

Date: 4/13/2005

This report contains the information necessary to demonstrate attainment of cleanup objectives and final closure of IHSS Group NE-1, North Firing Range (PAC NW-1505), including the following:

- Site characterization information
  - Description of site characterization activities, and
  - Site characterization data, including data tables and maps;
- Site accelerated action information
  - Description of accelerated action, including the rationale for the action,
  - Map of the project area and dates and durations of specific remedial activities, and
  - Photographs documenting site characterization, remediation, and reclamation activities;
- Confirmation sampling data, including data tables and location maps, as well as a comparison of the confirmation data to applicable cleanup goals;
- Description of deviations from the ER RSOP (DOE 2003);
- Description of the Subsurface Soil Risk Screen (SSRS);
- Description of near-term stewardship actions and long-term stewardship recommendations;
- Disposition of wastes;
- Site reclamation information;
- Table of No Longer Representative (NLR) locations (and associated sample numbers) that were remediated. These data will be used to mark database records so they are not used in the CRA or other Site analyses; and
- Data Quality Assessment (DQA), including comparisons of characterization and confirmation data with project data quality objectives (DQOs).

Approval of this Closeout Report constitutes regulatory agency concurrence that IHSS Group NE-1, North Firing Range (PAC NW-1505) is a No Further Accelerated Action (NFAA) Site. This information and NFAA determination will be documented in the Fiscal Year (FY) 2005 (05) Annual Update for the Historical Release Report (HRR).

2.0 SITE CHARACTERIZATION

PAC NW-1505, the North Firing Range, was constructed in 1983 and upgraded in 1994 and 1996. The principal firearms used at the range were pistols and rifles; however, machine guns up to 0.50 caliber and shotguns were also fired. Shotgun practice was confined to target shooting at paper silhouettes; no clay pigeons were used.

Photographs indicate that the south face of the north berm was cut back twice in the past (i.e. dug out to the north). During the 1994 upgrade, soil was excavated from the south

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face of the north berm for the first time to accommodate installation of a roof for the range and a mechanical target management system. The second excavation event occurred during the 1996 upgrade to accommodate additional space for a bullet trap mechanism behind the targets.

As part of decontamination and decommissioning (D&D), the concrete slab, range roof structure, target system, bullet trap, asphalt-paved parking area, buildings, and storage cargo containers at the North Firing Range were removed.

The IABZSAP #IABZ-05-01 identified the potential contaminants of concern (PCOCs) as metals, and prescribed a combination of statistical and bias samples for analysis (DOE 2004c). Three "hotspot" removals were identified for accelerated action and resulted in ER RSOP Notification #05-05 (DOE 2005a).

Accelerated action analytical data were collected in accordance with the IABZSAP (DOE 2004b). Sampling specifications, including PCOCs, media sampled, and deviations from planned locations, are presented in Table 1. Table 2 presents a summary of accelerated action and confirmation sampling analyses.

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Table 1
IHSS Group NE-1, North Firing Range (PAC NW-1505) Accelerated Action Sampling Specifications and Deviations

Location	Actual Northing	Actual Easting	Planned Northing	Planned Easting	Media	Depth Interval	Analytes	Comments/Deviations
Characterization Sample Locations								
BU52-000	752062.844	2081669.004	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	No bullets found when sieved.
BU52-001	752030.792	2081665.915	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	No bullets found when sieved.
BU53-000	752074.536	2081735.401	752074.531	2081735.427	Surface soil	0.0-0.5	Onsite and Offsite Metals	No significant difference.
BU53-001	752112.901	2081700.413	N/A	N/A	Surface Soil	0.0-0.5	Onsite and Offsite Metals	Added geoprobe location.
BU53-001	752112.901	2081700.413	N/A	N/A	Subsurface Soil	0.5-2.5	Onsite and Offsite Metals	Added geoprobe location.
BU53-002	752124.348	2081730.201	N/A	N/A	Surface Soil	0.0-0.5	Onsite Metals	Added geoprobe location
BU53-002	752124.348	2081730.201	N/A	N/A	Subsurface Soil	0.5-2.5	Onsite Metals	Added geoprobe location
BU53-004	752091.024	2081679.633	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	No bullets found when sieved.
BV53-000	752109.12	2081745.274	752109.143	2081745.327	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-001	752117.909	2081780.264	752117.875	2081780.252	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-002	752126.556	2081815.151	752126.607	2081815.177	Surface soil	0.0-0.5	Onsite Metals	Equivalent additional location collected at BV53-051.
BV53-003	752135.289	2081850.122	752135.339	2081850.102	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-004	752144.062	2081885.051	752144.071	2081885.027	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-005	752152.806	2081919.958	752152.803	2081919.952	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-006	752083.2	2081770.405	752083.263	2081770.352	Surface soil	0.0-0.5	Onsite and Offsite Metals	No significant difference.
BV53-007	752092.029	2081805.298	752091.995	2081805.277	Surface soil	0.0-0.5	Onsite Metals	No significant difference.

Location	Actual Northing	Actual Easting	Planned Northing	Planned Easting	Media	Depth Interval	Analytes	Comments/Deviations
BV53-008	752100.764	2081840.215	752100.727	2081840.202	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-009	752109.546	2081875.072	752109.459	2081875.127	Surface soil	0.0-0.5	Onsite and Offsite Metals	No significant difference.
BV53-010	752118.231	2081910.042	752118.191	2081910.052	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-011	752048.718	2081760.425	752048.651	2081760.451	Surface soil	0.0-0.5	Onsite Metals	Equivalent additional location collected at BV53-044.
BV53-012	752073.621	2081791.436	752057.383	2081795.376	Surface soil	0.0-0.5	Onsite and Offsite Metals	No significant difference.
BV53-013	752082.608	2081827.048	752066.115	2081830.301	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-014	752092.278	2081859.89	752074.847	2081865.226	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-015	752104.003	2081894.643	752083.579	2081900.151	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-016	752092.296	2081935.026	752092.311	2081935.076	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-017	752060.145	2081787.132	752027.109	2081787.14	Surface soil	0.0-0.5	Onsite and Offsite Metals	Moved about 33 feet north to sample toe of berm (planned location fell in concrete trench)
BV53-018	752063.882	2081797.359	752030.861	2081797.324	Surface soil	0.0-0.5	Onsite Metals	Moved about 33 feet north to sample toe of berm (planned location fell in concrete trench)
BV53-019	752067.614	2081808.108	752034.613	2081808.044	Surface soil	0.0-0.5	Onsite Metals	Moved about 33 feet north to sample toe of berm (planned location fell in concrete trench)
BV53-020	752072.428	2081819.812	752039.437	2081819.836	Surface soil	0.0-0.5	Onsite Metals	Moved about 33 feet north to sample toe of berm (planned location fell in concrete trench). Equivalent additional location collected at BV53-049.
BV53-021	752076.239	2081831.573	752043.189	2081831.628	Surface soil	0.0-0.5	Onsite Metals	Moved about 33 feet north to sample toe of berm (planned location fell in concrete trench). Equivalent additional location collected at BV53-050.
BV53-022	752079.08	2081844.167	752048.013	2081843.42	Surface soil	0.0-0.5	Onsite Metals	Moved about 33 feet north to sample toe of berm (planned location fell in concrete trench)
BV53-023	752082.945	2081856.927	752052.301	2081856.284	Surface soil	0.0-0.5	Onsite Metals	Moved about 33 feet north to sample toe of berm (planned location fell in concrete trench)
BV53-024	752087.534	2081868.507	752056.589	2081868.076	Surface soil	0.0-0.5	Onsite Metals	Moved about 33 feet north to sample toe of berm (planned location fell in concrete trench)

Location	Actual Northing	Actual Easting	Planned Northing	Planned Easting	Media	Depth Interval	Analytes	Comments/Deviations
BV53-025	752090.959	2081880.521	752060.877	2081879.332	Surface soil	0.0-0.5	Onsite Metals	Moved about 33 feet north to sample toe of berm (planned location fell in concrete trench)
BV53-026	752095.725	2081892.253	752065.165	2081891.66	Surface soil	0.0-0.5	Onsite Metals	Moved about 33 feet north to sample toe of berm (planned location fell in concrete trench). Equivalent additional location collected at BV53-052.
BV53-027	752099.682	2081906.387	752070.525	2081905.06	Surface soil	0.0-0.5	Onsite Metals	Moved about 33 feet north to sample toe of berm (planned location fell in concrete trench). Equivalent additional location collected at BV53-053.
BV53-028	752100.749	2081914.117	752075.349	2081917.924	Surface soil	0.0-0.5	Onsite Metals	Moved about 33 feet north to sample toe of berm (planned location fell in concrete trench). Equivalent additional location collected at BV53-054.
BV53-029	752073.364	2081935.683	752077.493	2081924.892	Surface soil	0.0-0.5	Onsite Metals	Located in drainage area. Equivalent additional location collected at BV53-055.
BV53-030	751997.665	2081807.12	751997.647	2081807.137	Surface soil	0.0-0.5	Onsite Metals	No significant difference. Equivalent additional location collected at BV53-046.
BV53-031	752006.89	2081845.073	752006.841	2081845.018	Surface soil	0.0-0.5	Onsite Metals	No significant difference. Equivalent additional location collected at BV53-047.
BV53-032	752015.676	2081878.812	752015.668	2081878.854	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-033	752023.755	2081913.418	752023.759	2081913.426	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-034	752031.801	2081820.319	752031.851	2081820.377	Surface soil	0.0-0.5	Onsite Metals	Equivalent additional location collected at BV53-048.
BV53-035	752040.642	2081855.312	752040.677	2081855.316	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-036	752049.114	2081889.829	752049.136	2081889.888	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-037	752057.533	2081924.764	752057.595	2081924.827	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BV53-038	752134.503	2081763.078	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	Added geoprobe location
BV53-038	752134.503	2081763.078	N/A	N/A	Subsurface soil	0.5-2.5	Onsite Metals	Added geoprobe location
BV53-039	752147.567	2081795.547	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	Added geoprobe location

Location	Actual Northing	Actual Easting	Planned Northing	Planned Easting	Media	Depth Interval	Analytes	Comments/Deviations
BV53-039	752147.567	2081795.547	N/A	N/A	Subsurface soil	0.5-2.5	Onsite Metals	Added geoprobe location
BV53-040	752158.121	2081827.759	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	Added geoprobe location
BV53-040	752158.121	2081827.759	N/A	N/A	Subsurface soil	0.5-2.5	Onsite Metals	Added geoprobe location
BV53-041	752168.151	2081858.501	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	Added geoprobe location
BV53-041	752168.151	2081858.501	N/A	N/A	Subsurface soil	0.5-2.5	Onsite Metals	Added geoprobe location
BV53-042	752179.559	2081891.857	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	Added geoprobe location.
BV53-042	752179.559	2081891.857	N/A	N/A	Subsurface soil	0.5-2.5	Onsite Metals	Added geoprobe location.
BV53-043	752022.812	2081769.962	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	No bullets found when sieved. Equivalent additional location collected at BV53-045.
BV53-044	752048.533	2081760.295	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BV53-011
BV53-045	752022.768	2081769.805	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BV53-043
BV53-046	751997.513	2081807.246	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BV53-030
BV53-047	752006.703	2081845.118	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BV53-031
BV53-048	752031.504	2081820.146	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BV53-034
BV53-049	752072.623	2081819.529	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BV53-020
BV53-050	752075.844	2081831.666	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BV53-021
BV53-051	752126.706	2081815.103	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BV53-002
BV53-052	752095.858	2081892.105	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BV53-026
BV53-053	752099.592	2081906.349	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BV53-027

Location	Actual Northing	Actual Easting	Planned Northing	Planned Easting	Media	Depth Interval	Analytes	Comments/Deviations
BV53-054	752100.874	2081914.156	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BV53-028
BV53-055	752073.505	2081935.635	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BV53-029
BV54-000	752189.857	2081923.55	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	Added geoprobe location
BV54-000	752189.857	2081923.55	N/A	N/A	Subsurface soil	0.5-2.5	Onsite Metals	Added geoprobe location
BW53-000	752126.936	2081944.96	752126.923	2081944.976	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BW53-001	752114.494	2082072.144	752123.588	2082066.931	Surface soil	0.0-0.5	Onsite and Offsite Metals	No significant difference.
BW53-002	752201.608	2081991.468	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	No bullets found when sieved.
BW53-003	752186.523	2082020.737	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	No bullets found when sieved. Equivalent additional location collected at BW53-011.
BW53-004	752072.887	2081950.831	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	No bullets found when sieved. Equivalent additional location collected at BW53-010.
BW53-005	752157.169	2082041.396	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	No bullets found when sieved. Equivalent additional location collected at BW53-012.
BW53-010	752072.748	2081950.800	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BW53-004
BW53-011	752186.562	2082020.697	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BW53-003
BW53-012	752157.282	2082041.453	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BW53-005
BW54-000	752161.54	2081954.92	752161.535	2081954.877	Surface soil	0.0-0.5	Onsite Metals	Equivalent additional location collected at BW54-004.
BW54-001	752170.24	2081989.772	752170.267	2081989.802	Surface soil	0.0-0.5	Onsite Metals	No significant difference.
BW54-002	752201.242	2081959.586	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	Added geoprobe location
BW54-002	752201.242	2081959.586	N/A	N/A	Subsurface soil	0.5-2.5	Onsite Metals	Added geoprobe location
BW54-003	752199.769	2081994.951	N/A	N/A	Surface soil	0.0-0.5	Onsite Metals	Added geoprobe location

Location	Actual Northing	Actual Easting	Planned Northing	Planned Easting	Media	Depth Interval	Analytes	Comments/Deviations
BW54-003	752199.769	2081994.951	N/A	N/A	Subsurface soil	0.5-2.5	Onsite Metals	Added geoprobe location
BW54-004	752161.619	2081955.022	N/A	N/A	Surface soil	0.0-0.25	Offsite Metals	Resampled 16 locations for offsite metals analysis. Biased-original code BW54-000
Confirmation Sample Locations								
BV53-056	752070.622	2081924.925	N/A	N/A	Subsurface soil	0.0-2.0	Onsite and Offsite Metals	Hot spot at BV53-055. North sidewall 0-2 ft.
BV53-057	752061.728	2081928.012	N/A	N/A	Subsurface soil	0.0-2.0	Onsite and Offsite Metals	Hot spot at BV53-055. South sidewall 0-2 ft.
BV53-058	752064.135	2081915.743	N/A	N/A	Subsurface soil	0.0-2.0	Onsite and Offsite Metals	Hot spot at BV53-055. West sidewall 0-2 ft.
BV53-059	752074.128	2081936.547	N/A	N/A	Subsurface soil	0.0-2.0	Onsite and Offsite Metals	Hot spot at BV53-055. East sidewall 0-2 ft.
BV53-060	752067.347	2081927.503	N/A	N/A	Subsurface soil	2.0-2.3	Onsite and Offsite Metals	Hot spot at BV53-055. Center bottom 2-2.3 ft.
BV53-061	752052.973	2081888.953	N/A	N/A	Subsurface soil	0.0-2.0	Onsite and Offsite Metals	Hot spot at BV53-036. North sidewall 0-2 ft.
BV53-062	752041.875	2081890.497	N/A	N/A	Subsurface soil	0.0-2.0	Onsite and Offsite Metals	Hot spot at BV53-036. South sidewall 0-2 ft.
BV53-063	752048.423	2081893.899	N/A	N/A	Subsurface soil	0.0-2.0	Onsite and Offsite Metals	Hot spot at BV53-036. East sidewall 0-2 ft.
BV53-064	752046.628	2081885.692	N/A	N/A	Subsurface soil	0.0-2.0	Onsite and Offsite Metals	Hot spot at BV53-036. West sidewall 0-2 ft.
BV53-065	752047.592	2081889.646	N/A	N/A	Subsurface soil	2.0-2.3	Onsite and Offsite Metals	Hot spot at BV53-036. Center bottom 2-2.3 ft.
BV53-066	752054.770	2081888.982	N/A	N/A	Subsurface soil	1.0-1.3	Onsite and Offsite Metals	Hot spot at BV53-036. Second excavation for north sidewall - composite depth 1-1.3 ft.
BV53-067	752039.203	2081891.599	N/A	N/A	Subsurface soil	1.0-1.3	Onsite and Offsite Metals	Hot spot at BV53-036. Second excavation at south sidewall - composite depth 1-1.3 ft.
BV53-068	752067.502	2081928.144	N/A	N/A	Subsurface soil	3.0-3.2	Onsite and Offsite Metals	Hot spot at BV53-055. Second excavation at center bottom - depth 3-3.3 ft.
BV53-068	752067.502	2081928.144	N/A	N/A	Subsurface soil	4.0-4.3	Onsite and Offsite Metals	Hot spot at BV53-055. Second excavation at center bottom - depth 3-3.3 ft.
BV53-069	752029.197	2081893.257	N/A	N/A	Subsurface soil	1.0-1.3	Onsite and Offsite Metals	Hot spot at BV53-036. Third excavation at south sidewall - composite depth 1-1.3 ft.

Location	Actual Northing	Actual Easting	Planned Northing	Planned Easting	Media	Depth Interval	Analytes	Comments/Deviations
BV53-070	752022.638	2081894.843	N/A	N/A	Subsurface soil	0.0-2.0	Onsite and Offsite Metals	Hot spot at BV53-036. Fourth excavation at south sidewall. Composite 0-2' at furthest west excavation.
BW53-013	752119.507	2082057.872	N/A	N/A	Subsurface soil	0.0-2.0	Onsite and Offsite Metals	Hot spot at BW53-001. North sidewall 0-2 ft.
BW53-014	752111.142	2082077.369	N/A	N/A	Subsurface soil	0.0-2.0	Onsite and Offsite Metals	Hot spot at BW53-001. South sidewall 0-2 ft.
BW53-015	752114.114	2082069.393	N/A	N/A	Subsurface soil	0.0-3.0	Onsite and Offsite Metals	Hot spot at BW53-001. West sidewall 0-3 ft.
BW53-016	752116.986	2082085.057	N/A	N/A	Subsurface soil	0.0-1.0	Onsite and Offsite Metals	Hot spot at BW53-001. East sidewall 0-1 ft.
BW53-017	752115.301	2082075.996	N/A	N/A	Subsurface soil	2.0-2.2	Onsite and Offsite Metals	Hot spot at BW53-001. Center bottom 2-2.2 ft.
BW53-018	752085.277	2081976.957	N/A	N/A	Subsurface soil	9.0-9.3	Onsite and Offsite Metals/ EPA Split	West end of culvert. Also collected a "waste sample from inside culvert, using same location code. Depth measured from top of berm.
BW53-019	752093.512	2082004.884	N/A	N/A	Subsurface soil	21.5-21.8	Onsite and Offsite Metals/ EPA Split	Middle of culvert. Depth measured from top of berm.
BW53-020	752102.391	2082035.758	N/A	N/A	Subsurface soil	9.0-9.3	Onsite and Offsite Metals/ EPA Split	East end of culvert. Depth measured from top of berm.

N/A – Not Applicable

Table 2
IHSS Group NE-1, North Firing Range (PAC NW-1505)
Accelerated Action Characterization and
Confirmation/In-Process Soil Sampling Analysis Summary

Characterization Sampling		
Category	**Planned Total**	**Actual Total**
Number of Sampling Locations	35	61
Number of Samples	35	71
Number of Metals Analyses	35	71
Confirmation/In-Process Sampling		
Category	**Planned Total**	**Actual Total**
Number of Sampling Locations	15	39
Number of Samples	15	39
Number of Metals Analyses	15	39

2.1 Historical Information

No historical analytical data exists for the North Firing Range prior to the execution of IABZSAP #IABZ-05-01 (DOE 2004c).

2.2 Pre-accelerated Action Data

No preaccelerated action data exists for the North Firing Range prior to the execution of IABZSAP #IABZ-05-01 (DOE 2004c).

2.3 Accelerated Action Data

Sixty one accelerated action soil characterization locations were sampled in the North Firing Range (PAC NW-1505). Characterization samples were analyzed for metals to determine the areal extent of contamination in the firing range area.

Twenty-six sampling locations contained arsenic results greater than the wildlife refuge worker (WRW) action level (AL) of 22.2 milligrams per kilogram (mg/kg). In accordance with ER RSOP Notification #05-05 it was agreed that the North Firing Range remediation of arsenic WRW AL exceedances analyzed using the SW-846 6200 methodology was not warranted. As shown in Table 1 in the ER RSOP #05-05, arsenic concentrations determined using the SW-846 6200 method (on-site, x-ray fluorescence [XRF]) are up to several orders of magnitude greater than those determined using SW-846 6010, a more accurate method (off-site, inductively coupled plasma [ICP] spectrometry) (DOE 2005a). Method SW-846 6200 was used to evaluate metals other than arsenic.

Three soil sampling locations (BW53-001, BV53-036 and BV53-055) returned surface soil WRW AL exceedances for lead at 3,500, 1,680 and 6,200 mg/kg, respectively. These three locations were identified for removal in Notification #05-05 (DOE 2005a). Figures 3 and 4 show the IHSS Group NE-1, North Firing Range (PAC NW-1505) characterization analytical

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results that were greater than background means plus two standard deviations. The soil excavation is described in the following paragraphs.

Excavation area number one required four different excavation events. Excavation area number two required two different events before being deemed complete, and excavation area number three required only one event before being deemed complete.

The remaining and representative confirmation sample locations represent confirmation samples collected on the north, south, west, east sideslopes, and the center bottom of the excavations. Sample results greater than background means plus two standard deviations are shown on Figure 5.

Twenty-three excavation confirmation samples were collected at the North Firing Range. All samples were analyzed via both SW-846 6010 (off site) and SW-846 6200 (on site) analytical methods. Table 3 presents the analytical results for all accelerated action characterization and confirmation samples. Figure 5 illustrates the three excavation boundaries and displays the confirmation and in process sample results that were greater than background means plus two standard deviations. Analytical results with concentrations greater than RFCA WRW ALs, including those samples that are no longer representative (NLR) and arsenic concentrations greater than the WRW AL but less than clean-up levels, are identified with bold text on Table 3. Figure 6 illustrates the residual concentrations of analytes bounding the three excavation areas at IHSS Group NE-1, North Firing Range (PAC NW-1505).

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Table 3
IHSS Group NE-1 North Firing Range (NW-1505) Accelerated Action Characterization and Confirmation Sampling Results Greater Than Background Means Plus Two Standard Deviations

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
Characterization Samples										
BU52-000	752062.844	2081669.004	0.00	0.50	Barium	868.00	26400	141.26	mg/kg	SW-846 6200
BU52-000	752062.844	2081669.004	0.00	0.50	Chromium	43.80	268	16.99	mg/kg	SW-846 6200
BU52-000	752062.844	2081669.004	0.00	0.50	Iron	38200.00	307000	18037.00	mg/kg	SW-846 6200
BU52-000	752062.844	2081669.004	0.00	0.50	Manganese	485.00	3480	365.08	mg/kg	SW-846 6200
BU52-000	752062.844	2081669.004	0.00	0.50	Nickel	47.30	20400	14.91	mg/kg	SW-846 6200
BU52-000	752062.844	2081669.004	0.00	0.50	Strontium	180.00	613000	48.94	mg/kg	SW-846 6200
BU52-001	752030.792	2081665.915	0.00	0.50	Arsenic	19.80	22.2	10.09	mg/kg	SW-846 6200
BU52-001	752030.792	2081665.915	0.00	0.50	Barium	867.00	26400	141.26	mg/kg	SW-846 6200
BU52-001	752030.792	2081665.915	0.00	0.50	Chromium	60.50	268	16.99	mg/kg	SW-846 6200
BU52-001	752030.792	2081665.915	0.00	0.50	Iron	38000.00	307000	18037.00	mg/kg	SW-846 6200
BU52-001	752030.792	2081665.915	0.00	0.50	Manganese	464.00	3480	365.08	mg/kg	SW-846 6200
BU52-001	752030.792	2081665.915	0.00	0.50	Nickel	46.90	20400	14.91	mg/kg	SW-846 6200
BU52-001	752030.792	2081665.915	0.00	0.50	Strontium	176.00	613000	48.94	mg/kg	SW-846 6200
BU52-001	752030.792	2081665.915	0.00	0.50	Vanadium	90.80	7150	45.59	mg/kg	SW-846 6200
BU53-000	752074.536	2081735.401	0.00	0.50	Aluminum	18000.00	228000	16902.00	mg/kg	SW-846 6010
BU53-000	752074.536	2081735.401	0.00	0.50	Copper	22.00	40900	18.06	mg/kg	SW-846 6010
BU53-000	752074.536	2081735.401	0.00	0.50	Lead	240.00	1000	54.62	mg/kg	SW-846 6010
BU53-000	752074.536	2081735.401	0.00	0.50	Lithium	14.00	20400	11.55	mg/kg	SW-846 6010
BU53-001	752112.901	2081700.413	0.00	0.50	Aluminum	18000.00	228000	16902.00	mg/kg	SW-846 6010
BU53-002	**752124.348**	**2081730.201**	**0.00**	**0.50**	**Arsenic**	**37.90**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BU53-002	752124.348	2081730.201	0.00	0.50	Barium	842.00	26400	141.26	mg/kg	SW-846 6200
BU53-002	752124.348	2081730.201	0.00	0.50	Chromium	42.50	268	16.99	mg/kg	SW-846 6200
BU53-002	752124.348	2081730.201	0.00	0.50	Iron	36100.00	307000	18037.00	mg/kg	SW-846 6200
BU53-002	752124.348	2081730.201	0.00	0.50	Nickel	47.30	20400	14.91	mg/kg	SW-846 6200
BU53-002	752124.348	2081730.201	0.00	0.50	Strontium	187.00	613000	48.94	mg/kg	SW-846 6200

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BU53-002	752124.348	2081730.201	0.00	0.50	Tin	12.90	613000	2.90	mg/kg	SW-846 6200
BU53-002	752124.348	2081730.201	0.00	0.50	Vanadium	82.20	7150	45.59	mg/kg	SW-846 6200
BU53-002	752124.348	2081730.201	0.50	2.50	Barium	402.00	26400	289.38	mg/kg	SW-846 6200
BU53-004	**752091.024**	**2081679.633**	**0.00**	**0.50**	**Arsenic**	**43.20**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BU53-004	752091.024	2081679.633	0.00	0.50	Barium	849.00	26400	141.26	mg/kg	SW-846 6200
BU53-004	752091.024	2081679.633	0.00	0.50	Chromium	44.90	268	16.99	mg/kg	SW-846 6200
BU53-004	752091.024	2081679.633	0.00	0.50	Iron	37200.00	307000	18037.00	mg/kg	SW-846 6200
BU53-004	752091.024	2081679.633	0.00	0.50	Lead	69.50	1000	54.62	mg/kg	SW-846 6200
BU53-004	752091.024	2081679.633	0.00	0.50	Manganese	452.00	3480	365.08	mg/kg	SW-846 6200
BU53-004	752091.024	2081679.633	0.00	0.50	Nickel	45.60	20400	14.91	mg/kg	SW-846 6200
BU53-004	752091.024	2081679.633	0.00	0.50	Strontium	183.00	613000	48.94	mg/kg	SW-846 6200
BU53-004	752091.024	2081679.633	0.00	0.50	Vanadium	92.00	7150	45.59	mg/kg	SW-846 6200
BV53-000	752109.120	2081745.274	0.00	0.50	Arsenic	18.60	22.2	10.09	mg/kg	SW-846 6200
BV53-000	752109.120	2081745.274	0.00	0.50	Barium	821.00	26400	141.26	mg/kg	SW-846 6200
BV53-000	752109.120	2081745.274	0.00	0.50	Chromium	37.30	268	16.99	mg/kg	SW-846 6200
BV53-000	752109.120	2081745.274	0.00	0.50	Cobalt	13.20	1550	10.91	mg/kg	SW-846 6200
BV53-000	752109.120	2081745.274	0.00	0.50	Iron	42100.00	307000	18037.00	mg/kg	SW-846 6200
BV53-000	752109.120	2081745.274	0.00	0.50	Manganese	642.00	3480	365.08	mg/kg	SW-846 6200
BV53-000	752109.120	2081745.274	0.00	0.50	Nickel	58.20	20400	14.91	mg/kg	SW-846 6200
BV53-000	752109.120	2081745.274	0.00	0.50	Strontium	245.00	613000	48.94	mg/kg	SW-846 6200
BV53-000	752109.120	2081745.274	0.00	0.50	Vanadium	104.00	7150	45.59	mg/kg	SW-846 6200
BV53-000	752109.120	2081745.274	0.00	0.50	Zinc	81.80	307000	73.76	mg/kg	SW-846 6200
BV53-001	**752117.909**	**2081780.264**	**0.00**	**0.50**	**Arsenic**	**22.30**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-001	752117.909	2081780.264	0.00	0.50	Barium	754.00	26400	141.26	mg/kg	SW-846 6200
BV53-001	752117.909	2081780.264	0.00	0.50	Chromium	35.80	268	16.99	mg/kg	SW-846 6200
BV53-001	752117.909	2081780.264	0.00	0.50	Iron	35200.00	307000	18037.00	mg/kg	SW-846 6200
BV53-001	752117.909	2081780.264	0.00	0.50	Nickel	44.90	20400	14.91	mg/kg	SW-846 6200
BV53-001	752117.909	2081780.264	0.00	0.50	Strontium	186.00	613000	48.94	mg/kg	SW-846 6200
BV53-003	**752135.289**	**2081850.122**	**0.00**	**0.50**	**Arsenic**	**35.60**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BV53-003	752135.289	2081850.122	0.00	0.50	Barium	790.00	26400	141.26	mg/kg	SW-846 6200
BV53-003	752135.289	2081850.122	0.00	0.50	Chromium	37.50	268	16.99	mg/kg	SW-846 6200
BV53-003	752135.289	2081850.122	0.00	0.50	Iron	32500.00	307000	18037.00	mg/kg	SW-846 6200
BV53-003	752135.289	2081850.122	0.00	0.50	Nickel	43.10	20400	14.91	mg/kg	SW-846 6200
BV53-003	752135.289	2081850.122	0.00	0.50	Strontium	185.00	613000	48.94	mg/kg	SW-846 6200
BV53-004	**752144.062**	**2081885.051**	**0.00**	**0.50**	**Arsenic**	**27.30**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-004	752144.062	2081885.051	0.00	0.50	Barium	765.00	26400	141.26	mg/kg	SW-846 6200
BV53-004	752144.062	2081885.051	0.00	0.50	Chromium	52.20	268	16.99	mg/kg	SW-846 6200
BV53-004	752144.062	2081885.051	0.00	0.50	Iron	35900.00	307000	18037.00	mg/kg	SW-846 6200
BV53-004	752144.062	2081885.051	0.00	0.50	Nickel	46.00	20400	14.91	mg/kg	SW-846 6200
BV53-004	752144.062	2081885.051	0.00	0.50	Strontium	183.00	613000	48.94	mg/kg	SW-846 6200
BV53-005	**752152.806**	**2081919.958**	**0.00**	**0.50**	**Arsenic**	**38.60**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-005	752152.806	2081919.958	0.00	0.50	Barium	729.00	26400	141.26	mg/kg	SW-846 6200
BV53-005	752152.806	2081919.958	0.00	0.50	Chromium	49.20	268	16.99	mg/kg	SW-846 6200
BV53-005	752152.806	2081919.958	0.00	0.50	Iron	38800.00	307000	18037.00	mg/kg	SW-846 6200
BV53-005	752152.806	2081919.958	0.00	0.50	Nickel	52.70	20400	14.91	mg/kg	SW-846 6200
BV53-005	752152.806	2081919.958	0.00	0.50	Strontium	219.00	613000	48.94	mg/kg	SW-846 6200
BV53-005	752152.806	2081919.958	0.00	0.50	Vanadium	96.10	7150	45.59	mg/kg	SW-846 6200
BV53-005	752152.806	2081919.958	0.00	0.50	Zinc	77.10	307000	73.76	mg/kg	SW-846 6200
BV53-006	752083.200	2081770.405	0.00	0.50	Aluminum	18000.00	228000	16902.00	mg/kg	SW-846 6010
BV53-006	752083.200	2081770.405	0.00	0.50	Antimony	0.69	409	0.47	mg/kg	SW-846 6010
BV53-006	752083.200	2081770.405	0.00	0.50	Chromium	17.00	268	16.99	mg/kg	SW-846 6010
BV53-006	752083.200	2081770.405	0.00	0.50	Copper	20.00	40900	18.06	mg/kg	SW-846 6010
BV53-006	752083.200	2081770.405	0.00	0.50	Lead	99.00	1000	54.62	mg/kg	SW-846 6010
BV53-006	752083.200	2081770.405	0.00	0.50	Nickel	15.00	20400	14.91	mg/kg	SW-846 6010
BV53-007	**752092.029**	**2081805.298**	**0.00**	**0.50**	**Arsenic**	**43.90**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-007	752092.029	2081805.298	0.00	0.50	Barium	822.00	26400	141.26	mg/kg	SW-846 6200
BV53-007	752092.029	2081805.298	0.00	0.50	Chromium	26.90	268	16.99	mg/kg	SW-846 6200
BV53-007	752092.029	2081805.298	0.00	0.50	Cobalt	11.60	1550	10.91	mg/kg	SW-846 6200

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BV53-007	752092.029	2081805.298	0.00	0.50	Iron	38700.00	307000	18037.00	mg/kg	SW-846 6200
BV53-007	752092.029	2081805.298	0.00	0.50	Lead	236.00	1000	54.62	mg/kg	SW-846 6200
BV53-007	752092.029	2081805.298	0.00	0.50	Nickel	49.40	20400	14.91	mg/kg	SW-846 6200
BV53-007	752092.029	2081805.298	0.00	0.50	Strontium	184.00	613000	48.94	mg/kg	SW-846 6200
BV53-007	752092.029	2081805.298	0.00	0.50	Tin	11.70	613000	2.90	mg/kg	SW-846 6200
BV53-007	752092.029	2081805.298	0.00	0.50	Vanadium	95.40	7150	45.59	mg/kg	SW-846 6200
BV53-008	752100.764	2081840.215	0.00	0.50	Antimony	16.10	409	0.47	mg/kg	SW-846 6200
BV53-008	**752100.764**	**2081840.215**	**0.00**	**0.50**	**Arsenic**	**36.60**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-008	752100.764	2081840.215	0.00	0.50	Barium	877.00	26400	141.26	mg/kg	SW-846 6200
BV53-008	752100.764	2081840.215	0.00	0.50	Chromium	37.40	268	16.99	mg/kg	SW-846 6200
BV53-008	752100.764	2081840.215	0.00	0.50	Iron	34300.00	307000	18037.00	mg/kg	SW-846 6200
BV53-008	752100.764	2081840.215	0.00	0.50	Lead	225.00	1000	54.62	mg/kg	SW-846 6200
BV53-008	752100.764	2081840.215	0.00	0.50	Nickel	46.00	20400	14.91	mg/kg	SW-846 6200
BV53-008	752100.764	2081840.215	0.00	0.50	Strontium	178.00	613000	48.94	mg/kg	SW-846 6200
BV53-009	752109.546	2081875.072	0.00	0.50	Aluminum	18000.00	228000	16902.00	mg/kg	SW-846 6010
BV53-009	752109.546	2081875.072	0.00	0.50	Antimony	0.67	409	0.47	mg/kg	SW-846 6010
BV53-009	752109.546	2081875.072	0.00	0.50	Beryllium	1.00	921	0.97	mg/kg	SW-846 6010
BV53-009	752109.546	2081875.072	0.00	0.50	Lead	110.00	1000	54.62	mg/kg	SW-846 6010
BV53-010	**752118.231**	**2081910.042**	**0.00**	**0.50**	**Arsenic**	**38.40**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-010	752118.231	2081910.042	0.00	0.50	Barium	748.00	26400	141.26	mg/kg	SW-846 6200
BV53-010	752118.231	2081910.042	0.00	0.50	Chromium	40.00	268	16.99	mg/kg	SW-846 6200
BV53-010	752118.231	2081910.042	0.00	0.50	Iron	35400.00	307000	18037.00	mg/kg	SW-846 6200
BV53-010	752118.231	2081910.042	0.00	0.50	Lead	122.00	1000	54.62	mg/kg	SW-846 6200
BV53-010	752118.231	2081910.042	0.00	0.50	Nickel	45.50	20400	14.91	mg/kg	SW-846 6200
BV53-010	752118.231	2081910.042	0.00	0.50	Strontium	173.00	613000	48.94	mg/kg	SW-846 6200
BV53-010	752118.231	2081910.042	0.00	0.50	Vanadium	85.90	7150	45.59	mg/kg	SW-846 6200
BV53-012	752073.621	2081791.436	0.00	0.50	Aluminum	18000.00	228000	16902.00	mg/kg	SW-846 6010
BV53-012	752073.621	2081791.436	0.00	0.50	Antimony	0.67	409	0.47	mg/kg	SW-846 6010
BV53-012	752073.621	2081791.436	0.00	0.50	Beryllium	0.98	921	0.97	mg/kg	SW-846 6010

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BV53-012	752073.621	2081791.436	0.00	0.50	Copper	21.00	40900	18.06	mg/kg	SW-846 6010
BV53-012	752073.621	2081791.436	0.00	0.50	Lead	120.00	1000	54.62	mg/kg	SW-846 6010
BV53-013	**752082.608**	**2081827.048**	**0.00**	**0.50**	**Arsenic**	**52.80**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-013	752082.608	2081827.048	0.00	0.50	Barium	829.00	26400	141.26	mg/kg	SW-846 6200
BV53-013	752082.608	2081827.048	0.00	0.50	Chromium	47.90	268	16.99	mg/kg	SW-846 6200
BV53-013	752082.608	2081827.048	0.00	0.50	Iron	34900.00	307000	18037.00	mg/kg	SW-846 6200
BV53-013	752082.608	2081827.048	0.00	0.50	Lead	342.00	1000	54.62	mg/kg	SW-846 6200
BV53-013	752082.608	2081827.048	0.00	0.50	Nickel	42.80	20400	14.91	mg/kg	SW-846 6200
BV53-013	752082.608	2081827.048	0.00	0.50	Strontium	162.00	613000	48.94	mg/kg	SW-846 6200
BV53-013	752082.608	2081827.048	0.00	0.50	Vanadium	89.20	7150	45.59	mg/kg	SW-846 6200
BV53-014	752092.278	2081859.890	0.00	0.50	Antimony	13.30	409	0.47	mg/kg	SW-846 6200
BV53-014	**752092.278**	**2081859.890**	**0.00**	**0.50**	**Arsenic**	**67.30**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-014	752092.278	2081859.890	0.00	0.50	Barium	724.00	26400	141.26	mg/kg	SW-846 6200
BV53-014	752092.278	2081859.890	0.00	0.50	Chromium	46.60	268	16.99	mg/kg	SW-846 6200
BV53-014	752092.278	2081859.890	0.00	0.50	Iron	35000.00	307000	18037.00	mg/kg	SW-846 6200
BV53-014	752092.278	2081859.890	0.00	0.50	Lead	608.00	1000	54.62	mg/kg	SW-846 6200
BV53-014	752092.278	2081859.890	0.00	0.50	Nickel	44.90	20400	14.91	mg/kg	SW-846 6200
BV53-014	752092.278	2081859.890	0.00	0.50	Selenium	2.46	5110	1.22	mg/kg	SW-846 6200
BV53-014	752092.278	2081859.890	0.00	0.50	Strontium	159.00	613000	48.94	mg/kg	SW-846 6200
BV53-014	752092.278	2081859.890	0.00	0.50	Vanadium	89.50	7150	45.59	mg/kg	SW-846 6200
BV53-015	752104.003	2081894.643	0.00	0.50	Antimony	13.50	409	0.47	mg/kg	SW-846 6200
BV53-015	**752104.003**	**2081894.643**	**0.00**	**0.50**	**Arsenic**	**56.40**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-015	752104.003	2081894.643	0.00	0.50	Barium	804.00	26400	141.26	mg/kg	SW-846 6200
BV53-015	752104.003	2081894.643	0.00	0.50	Chromium	34.60	268	16.99	mg/kg	SW-846 6200
BV53-015	752104.003	2081894.643	0.00	0.50	Iron	34000.00	307000	18037.00	mg/kg	SW-846 6200
BV53-015	752104.003	2081894.643	0.00	0.50	Lead	375.00	1000	54.62	mg/kg	SW-846 6200
BV53-015	752104.003	2081894.643	0.00	0.50	Nickel	40.90	20400	14.91	mg/kg	SW-846 6200
BV53-015	752104.003	2081894.643	0.00	0.50	Strontium	170.00	613000	48.94	mg/kg	SW-846 6200
BV53-015	752104.003	2081894.643	0.00	0.50	Vanadium	69.40	7150	45.59	mg/kg	SW-846 6200

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BV53-015	752104.003	2081894.643	0.00	0.50	Zinc	74.20	307000	73.76	mg/kg	SW-846 6200
BV53-016	752092.296	2081935.026	0.00	0.50	Antimony	18.70	409	0.47	mg/kg	SW-846 6200
BV53-016	**752092.296**	**2081935.026**	**0.00**	**0.50**	**Arsenic**	**52.00**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-016	752092.296	2081935.026	0.00	0.50	Barium	752.00	26400	141.26	mg/kg	SW-846 6200
BV53-016	752092.296	2081935.026	0.00	0.50	Chromium	43.80	268	16.99	mg/kg	SW-846 6200
BV53-016	752092.296	2081935.026	0.00	0.50	Iron	37100.00	307000	18037.00	mg/kg	SW-846 6200
BV53-016	752092.296	2081935.026	0.00	0.50	Lead	697.00	1000	54.62	mg/kg	SW-846 6200
BV53-016	752092.296	2081935.026	0.00	0.50	Nickel	49.20	20400	14.91	mg/kg	SW-846 6200
BV53-016	752092.296	2081935.026	0.00	0.50	Strontium	176.00	613000	48.94	mg/kg	SW-846 6200
BV53-016	752092.296	2081935.026	0.00	0.50	Tin	12.20	613000	2.90	mg/kg	SW-846 6200
BV53-016	752092.296	2081935.026	0.00	0.50	Zinc	83.00	307000	73.76	mg/kg	SW-846 6200
BV53-017	752060.145	2081787.132	0.00	0.50	Aluminum	22000.00	228000	16902.00	mg/kg	SW-846 6010
BV53-017	752060.145	2081787.132	0.00	0.50	Antimony	0.56	409	0.47	mg/kg	SW-846 6010
BV53-017	752060.145	2081787.132	0.00	0.50	Beryllium	1.10	921	0.97	mg/kg	SW-846 6010
BV53-017	752060.145	2081787.132	0.00	0.50	Chromium	18.00	268	16.99	mg/kg	SW-846 6010
BV53-017	752060.145	2081787.132	0.00	0.50	Copper	22.00	40900	18.06	mg/kg	SW-846 6010
BV53-017	752060.145	2081787.132	0.00	0.50	Lead	120.00	1000	54.62	mg/kg	SW-846 6010
BV53-017	752060.145	2081787.132	0.00	0.50	Lithium	12.00	20400	11.55	mg/kg	SW-846 6010
BV53-017	752060.145	2081787.132	0.00	0.50	Nickel	15.00	20400	14.91	mg/kg	SW-846 6010
BV53-018	752063.882	2081797.359	0.00	0.50	Antimony	22.40	409	0.47	mg/kg	SW-846 6200
BV53-018	**752063.882**	**2081797.359**	**0.00**	**0.50**	**Arsenic**	**75.80**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-018	752063.882	2081797.359	0.00	0.50	Barium	726.00	26400	141.26	mg/kg	SW-846 6200
BV53-018	752063.882	2081797.359	0.00	0.50	Chromium	43.00	268	16.99	mg/kg	SW-846 6200
BV53-018	752063.882	2081797.359	0.00	0.50	Cobalt	11.40	1550	10.91	mg/kg	SW-846 6200
BV53-018	752063.882	2081797.359	0.00	0.50	Iron	36100.00	307000	18037.00	mg/kg	SW-846 6200
BV53-018	752063.882	2081797.359	0.00	0.50	Lead	590.00	1000	54.62	mg/kg	SW-846 6200
BV53-018	752063.882	2081797.359	0.00	0.50	Nickel	48.80	20400	14.91	mg/kg	SW-846 6200
BV53-018	752063.882	2081797.359	0.00	0.50	Selenium	1.94	5110	1.22	mg/kg	SW-846 6200
BV53-018	752063.882	2081797.359	0.00	0.50	Strontium	168.00	613000	48.94	mg/kg	SW-846 6200

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BV53-018	752063.882	2081797.359	0.00	0.50	Vanadium	90.60	7150	45.59	mg/kg	SW-846 6200
BV53-018	752063.882	2081797.359	0.00	0.50	Zinc	113.00	307000	73.76	mg/kg	SW-846 6200
BV53-019	**752067.614**	**2081808.108**	**0.00**	**0.50**	**Arsenic**	**38.30**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-019	752067.614	2081808.108	0.00	0.50	Barium	767.00	26400	141.26	mg/kg	SW-846 6200
BV53-019	752067.614	2081808.108	0.00	0.50	Chromium	43.40	268	16.99	mg/kg	SW-846 6200
BV53-019	752067.614	2081808.108	0.00	0.50	Cobalt	12.10	1550	10.91	mg/kg	SW-846 6200
BV53-019	752067.614	2081808.108	0.00	0.50	Iron	38800.00	307000	18037.00	mg/kg	SW-846 6200
BV53-019	752067.614	2081808.108	0.00	0.50	Nickel	51.40	20400	14.91	mg/kg	SW-846 6200
BV53-019	752067.614	2081808.108	0.00	0.50	Strontium	177.00	613000	48.94	mg/kg	SW-846 6200
BV53-019	752067.614	2081808.108	0.00	0.50	Vanadium	87.40	7150	45.59	mg/kg	SW-846 6200
BV53-019	752067.614	2081808.108	0.00	0.50	Zinc	80.10	307000	73.76	mg/kg	SW-846 6200
BV53-022	**752079.080**	**2081844.167**	**0.00**	**0.50**	**Arsenic**	**37.10**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-022	752079.080	2081844.167	0.00	0.50	Barium	775.00	26400	141.26	mg/kg	SW-846 6200
BV53-022	752079.080	2081844.167	0.00	0.50	Chromium	36.90	268	16.99	mg/kg	SW-846 6200
BV53-022	752079.080	2081844.167	0.00	0.50	Cobalt	11.70	1550	10.91	mg/kg	SW-846 6200
BV53-022	752079.080	2081844.167	0.00	0.50	Iron	34000.00	307000	18037.00	mg/kg	SW-846 6200
BV53-022	752079.080	2081844.167	0.00	0.50	Nickel	44.50	20400	14.91	mg/kg	SW-846 6200
BV53-022	752079.080	2081844.167	0.00	0.50	Strontium	179.00	613000	48.94	mg/kg	SW-846 6200
BV53-022	752079.080	2081844.167	0.00	0.50	Vanadium	84.70	7150	45.59	mg/kg	SW-846 6200
BV53-023	**752082.945**	**2081856.927**	**0.00**	**0.50**	**Arsenic**	**43.10**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-023	752082.945	2081856.927	0.00	0.50	Barium	683.00	26400	141.26	mg/kg	SW-846 6200
BV53-023	752082.945	2081856.927	0.00	0.50	Chromium	35.50	268	16.99	mg/kg	SW-846 6200
BV53-023	752082.945	2081856.927	0.00	0.50	Cobalt	12.50	1550	10.91	mg/kg	SW-846 6200
BV53-023	752082.945	2081856.927	0.00	0.50	Iron	37500.00	307000	18037.00	mg/kg	SW-846 6200
BV53-023	752082.945	2081856.927	0.00	0.50	Nickel	49.70	20400	14.91	mg/kg	SW-846 6200
BV53-023	752082.945	2081856.927	0.00	0.50	Strontium	159.00	613000	48.94	mg/kg	SW-846 6200
BV53-023	752082.945	2081856.927	0.00	0.50	Vanadium	105.00	7150	45.59	mg/kg	SW-846 6200
BV53-023	752082.945	2081856.927	0.00	0.50	Zinc	78.90	307000	73.76	mg/kg	SW-846 6200
BV53-024	**752087.534**	**2081868.507**	**0.00**	**0.50**	**Arsenic**	**35.60**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BV53-024	752087.534	2081868.507	0.00	0.50	Barium	722.00	26400	141.26	mg/kg	SW-846 6200
BV53-024	752087.534	2081868.507	0.00	0.50	Chromium	49.70	268	16.99	mg/kg	SW-846 6200
BV53-024	752087.534	2081868.507	0.00	0.50	Cobalt	12.20	1550	10.91	mg/kg	SW-846 6200
BV53-024	752087.534	2081868.507	0.00	0.50	Iron	38500.00	307000	18037.00	mg/kg	SW-846 6200
BV53-024	752087.534	2081868.507	0.00	0.50	Nickel	53.80	20400	14.91	mg/kg	SW-846 6200
BV53-024	752087.534	2081868.507	0.00	0.50	Strontium	163.00	613000	48.94	mg/kg	SW-846 6200
BV53-024	752087.534	2081868.507	0.00	0.50	Vanadium	91.60	7150	45.59	mg/kg	SW-846 6200
BV53-025	**752090.959**	**2081880.521**	**0.00**	**0.50**	**Arsenic**	**39.00**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-025	752090.959	2081880.521	0.00	0.50	Barium	724.00	26400	141.26	mg/kg	SW-846 6200
BV53-025	752090.959	2081880.521	0.00	0.50	Chromium	48.20	268	16.99	mg/kg	SW-846 6200
BV53-025	752090.959	2081880.521	0.00	0.50	Cobalt	11.10	1550	10.91	mg/kg	SW-846 6200
BV53-025	752090.959	2081880.521	0.00	0.50	Iron	36500.00	307000	18037.00	mg/kg	SW-846 6200
BV53-025	752090.959	2081880.521	0.00	0.50	Lead	139.00	1000	54.62	mg/kg	SW-846 6200
BV53-025	752090.959	2081880.521	0.00	0.50	Nickel	48.10	20400	14.91	mg/kg	SW-846 6200
BV53-025	752090.959	2081880.521	0.00	0.50	Strontium	172.00	613000	48.94	mg/kg	SW-846 6200
BV53-025	752090.959	2081880.521	0.00	0.50	Vanadium	74.50	7150	45.59	mg/kg	SW-846 6200
BV53-025	752090.959	2081880.521	0.00	0.50	Zinc	81.30	307000	73.76	mg/kg	SW-846 6200
BV53-032	**752015.676**	**2081878.812**	**0.00**	**0.50**	**Arsenic**	**70.60**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-032	752015.676	2081878.812	0.00	0.50	Barium	767.00	26400	141.26	mg/kg	SW-846 6200
BV53-032	752015.676	2081878.812	0.00	0.50	Chromium	48.90	268	16.99	mg/kg	SW-846 6200
BV53-032	752015.676	2081878.812	0.00	0.50	Iron	37800.00	307000	18037.00	mg/kg	SW-846 6200
BV53-032	752015.676	2081878.812	0.00	0.50	Lead	562.00	1000	54.62	mg/kg	SW-846 6200
BV53-032	752015.676	2081878.812	0.00	0.50	Nickel	47.10	20400	14.91	mg/kg	SW-846 6200
BV53-032	752015.676	2081878.812	0.00	0.50	Selenium	2.66	5110	1.22	mg/kg	SW-846 6200
BV53-032	752015.676	2081878.812	0.00	0.50	Strontium	168.00	613000	48.94	mg/kg	SW-846 6200
BV53-032	752015.676	2081878.812	0.00	0.50	Vanadium	88.20	7150	45.59	mg/kg	SW-846 6200
BV53-033	**752023.755**	**2081913.418**	**0.00**	**0.50**	**Arsenic**	**33.20**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-033	752023.755	2081913.418	0.00	0.50	Barium	545.00	26400	141.26	mg/kg	SW-846 6200
BV53-033	752023.755	2081913.418	0.00	0.50	Chromium	21.30	268	16.99	mg/kg	SW-846 6200

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BV53-033	752023.755	2081913.418	0.00	0.50	Iron	19200.00	307000	18037.00	mg/kg	SW-846 6200
BV53-033	752023.755	2081913.418	0.00	0.50	Lead	143.00	1000	54.62	mg/kg	SW-846 6200
BV53-033	752023.755	2081913.418	0.00	0.50	Nickel	22.90	20400	14.91	mg/kg	SW-846 6200
BV53-033	752023.755	2081913.418	0.00	0.50	Strontium	142.00	613000	48.94	mg/kg	SW-846 6200
BV53-035	**752040.642**	**2081855.312**	**0.00**	**0.50**	**Arsenic**	**53.50**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-035	752040.642	2081855.312	0.00	0.50	Barium	743.00	26400	141.26	mg/kg	SW-846 6200
BV53-035	752040.642	2081855.312	0.00	0.50	Chromium	35.80	268	16.99	mg/kg	SW-846 6200
BV53-035	752040.642	2081855.312	0.00	0.50	Iron	38100.00	307000	18037.00	mg/kg	SW-846 6200
BV53-035	752040.642	2081855.312	0.00	0.50	Lead	190.00	1000	54.62	mg/kg	SW-846 6200
BV53-035	752040.642	2081855.312	0.00	0.50	Nickel	48.40	20400	14.91	mg/kg	SW-846 6200
BV53-035	752040.642	2081855.312	0.00	0.50	Strontium	160.00	613000	48.94	mg/kg	SW-846 6200
BV53-035	752040.642	2081855.312	0.00	0.50	Tin	10.80	613000	2.90	mg/kg	SW-846 6200
BV53-035	752040.642	2081855.312	0.00	0.50	Vanadium	101.00	7150	45.59	mg/kg	SW-846 6200
BV53-035	752040.642	2081855.312	0.00	0.50	Zinc	75.70	307000	73.76	mg/kg	SW-846 6200
BV53-036	752049.114	2081889.829	0.00	0.50	Antimony	27.30	409	0.47	mg/kg	SW-846 6200
BV53-036	**752049.114**	**2081889.829**	**0.00**	**0.50**	**Arsenic**	**131.00**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-036	752049.114	2081889.829	0.00	0.50	Barium	712.00	26400	141.26	mg/kg	SW-846 6200
BV53-036	752049.114	2081889.829	0.00	0.50	Chromium	42.40	268	16.99	mg/kg	SW-846 6200
BV53-036	752049.114	2081889.829	0.00	0.50	Iron	35900.00	307000	18037.00	mg/kg	SW-846 6200
BV53-036	**752049.114**	**2081889.829**	**0.00**	**0.50**	**Lead**	**1680.00**	**1000**	**54.62**	**mg/kg**	**SW-846 6200**
BV53-036	752049.114	2081889.829	0.00	0.50	Mercury	2.80	25200	0.13	mg/kg	SW-846 6200
BV53-036	752049.114	2081889.829	0.00	0.50	Nickel	42.70	20400	14.91	mg/kg	SW-846 6200
BV53-036	752049.114	2081889.829	0.00	0.50	Selenium	11.60	5110	1.22	mg/kg	SW-846 6200
BV53-036	752049.114	2081889.829	0.00	0.50	Strontium	160.00	613000	48.94	mg/kg	SW-846 6200
BV53-036	752049.114	2081889.829	0.00	0.50	Vanadium	69.50	7150	45.59	mg/kg	SW-846 6200
BV53-037	752057.533	2081924.764	0.00	0.50	Barium	679.00	26400	141.26	mg/kg	SW-846 6200
BV53-037	752057.533	2081924.764	0.00	0.50	Chromium	35.90	268	16.99	mg/kg	SW-846 6200
BV53-037	752057.533	2081924.764	0.00	0.50	Iron	36100.00	307000	18037.00	mg/kg	SW-846 6200
BV53-037	752057.533	2081924.764	0.00	0.50	Nickel	49.10	20400	14.91	mg/kg	SW-846 6200

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BV53-037	752057.533	2081924.764	0.00	0.50	Selenium	20.90	5110	1.22	mg/kg	SW-846 6200
BV53-037	752057.533	2081924.764	0.00	0.50	Vanadium	92.50	7150	45.59	mg/kg	SW-846 6200
BV53-037	752057.533	2081924.764	0.00	0.50	Zinc	100.00	307000	73.76	mg/kg	SW-846 6200
BV53-038	752134.503	2081763.078	0.00	0.50	Arsenic	17.50	22.2	10.09	mg/kg	SW-846 6200
BV53-038	752134.503	2081763.078	0.00	0.50	Barium	834.00	26400	141.26	mg/kg	SW-846 6200
BV53-038	752134.503	2081763.078	0.00	0.50	Chromium	38.00	268	16.99	mg/kg	SW-846 6200
BV53-038	752134.503	2081763.078	0.00	0.50	Iron	36200.00	307000	18037.00	mg/kg	SW-846 6200
BV53-038	752134.503	2081763.078	0.00	0.50	Nickel	44.30	20400	14.91	mg/kg	SW-846 6200
BV53-038	752134.503	2081763.078	0.00	0.50	Strontium	175.00	613000	48.94	mg/kg	SW-846 6200
BV53-038	752134.503	2081763.078	0.00	0.50	Vanadium	85.70	7150	45.59	mg/kg	SW-846 6200
BV53-038	752134.503	2081763.078	0.50	2.50	Barium	856.00	26400	289.38	mg/kg	SW-846 6200
BV53-039	752147.567	2081795.547	0.00	0.50	Arsenic	15.50	22.2	10.09	mg/kg	SW-846 6200
BV53-039	752147.567	2081795.547	0.00	0.50	Barium	712.00	26400	141.26	mg/kg	SW-846 6200
BV53-039	752147.567	2081795.547	0.00	0.50	Chromium	47.20	268	16.99	mg/kg	SW-846 6200
BV53-039	752147.567	2081795.547	0.00	0.50	Cobalt	11.20	1550	10.91	mg/kg	SW-846 6200
BV53-039	752147.567	2081795.547	0.00	0.50	Iron	37500.00	307000	18037.00	mg/kg	SW-846 6200
BV53-039	752147.567	2081795.547	0.00	0.50	Nickel	50.90	20400	14.91	mg/kg	SW-846 6200
BV53-039	752147.567	2081795.547	0.00	0.50	Strontium	164.00	613000	48.94	mg/kg	SW-846 6200
BV53-039	752147.567	2081795.547	0.00	0.50	Vanadium	83.80	7150	45.59	mg/kg	SW-846 6200
BV53-039	752147.567	2081795.547	0.50	2.50	Arsenic	19.90	22.2	13.14	mg/kg	SW-846 6200
BV53-039	752147.567	2081795.547	0.50	2.50	Barium	792.00	26400	289.38	mg/kg	SW-846 6200
BV53-039	752147.567	2081795.547	0.50	2.50	Vanadium	114.00	7150	88.49	mg/kg	SW-846 6200
BV53-040	752158.121	2081827.759	0.00	0.50	Arsenic	21.30	22.2	10.09	mg/kg	SW-846 6200
BV53-040	752158.121	2081827.759	0.00	0.50	Barium	780.00	26400	141.26	mg/kg	SW-846 6200
BV53-040	752158.121	2081827.759	0.00	0.50	Chromium	48.70	268	16.99	mg/kg	SW-846 6200
BV53-040	752158.121	2081827.759	0.00	0.50	Iron	37200.00	307000	18037.00	mg/kg	SW-846 6200
BV53-040	752158.121	2081827.759	0.00	0.50	Nickel	49.00	20400	14.91	mg/kg	SW-846 6200
BV53-040	752158.121	2081827.759	0.00	0.50	Strontium	169.00	613000	48.94	mg/kg	SW-846 6200
BV53-040	752158.121	2081827.759	0.00	0.50	Vanadium	105.00	7150	45.59	mg/kg	SW-846 6200

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BV53-040	752158.121	2081827.759	0.50	2.50	Arsenic	15.80	22.2	13.14	mg/kg	SW-846 6200
BV53-040	752158.121	2081827.759	0.50	2.50	Barium	590.00	26400	289.38	mg/kg	SW-846 6200
BV53-041	**752168.151**	**2081858.501**	**0.00**	**0.50**	**Arsenic**	**24.70**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-041	752168.151	2081858.501	0.00	0.50	Barium	958.00	26400	141.26	mg/kg	SW-846 6200
BV53-041	752168.151	2081858.501	0.00	0.50	Chromium	50.10	268	16.99	mg/kg	SW-846 6200
BV53-041	752168.151	2081858.501	0.00	0.50	Cobalt	12.30	1550	10.91	mg/kg	SW-846 6200
BV53-041	752168.151	2081858.501	0.00	0.50	Iron	40400.00	307000	18037.00	mg/kg	SW-846 6200
BV53-041	752168.151	2081858.501	0.00	0.50	Nickel	54.00	20400	14.91	mg/kg	SW-846 6200
BV53-041	752168.151	2081858.501	0.00	0.50	Strontium	244.00	613000	48.94	mg/kg	SW-846 6200
BV53-041	752168.151	2081858.501	0.00	0.50	Vanadium	87.20	7150	45.59	mg/kg	SW-846 6200
BV53-041	752168.151	2081858.501	0.50	2.50	Barium	760.00	26400	289.38	mg/kg	SW-846 6200
BV53-041	752168.151	2081858.501	0.50	2.50	Vanadium	91.80	7150	88.49	mg/kg	SW-846 6200
BV53-042	**752179.559**	**2081891.857**	**0.00**	**0.50**	**Arsenic**	**27.30**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV53-042	752179.559	2081891.857	0.00	0.50	Barium	794.00	26400	141.26	mg/kg	SW-846 6200
BV53-042	752179.559	2081891.857	0.00	0.50	Chromium	41.30	268	16.99	mg/kg	SW-846 6200
BV53-042	752179.559	2081891.857	0.00	0.50	Iron	33800.00	307000	18037.00	mg/kg	SW-846 6200
BV53-042	752179.559	2081891.857	0.00	0.50	Nickel	42.80	20400	14.91	mg/kg	SW-846 6200
BV53-042	752179.559	2081891.857	0.00	0.50	Strontium	194.00	613000	48.94	mg/kg	SW-846 6200
BV53-042	752179.559	2081891.857	0.00	0.50	Vanadium	79.80	7150	45.59	mg/kg	SW-846 6200
BV53-042	752179.559	2081891.857	0.50	2.50	Barium	615.00	26400	289.38	mg/kg	SW-846 6200
BV53-044	752048.533	2081760.295	0.00	0.25	Antimony	0.92	409	0.47	mg/kg	SW-846 6010
BV53-044	752048.533	2081760.295	0.00	0.25	Lead	88.00	1000	54.62	mg/kg	SW-846 6010
BV53-045	752022.768	2081769.805	0.00	0.25	Aluminum	17000.00	228000	16902.00	mg/kg	SW-846 6010
BV53-045	752022.768	2081769.805	0.00	0.25	Antimony	1.50	409	0.47	mg/kg	SW-846 6010
BV53-045	752022.768	2081769.805	0.00	0.25	Copper	29.00	40900	18.06	mg/kg	SW-846 6010
BV53-045	752022.768	2081769.805	0.00	0.25	Lead	440.00	1000	54.62	mg/kg	SW-846 6010
BV53-046	751997.513	2081807.246	0.00	0.25	Copper	26.00	40900	18.06	mg/kg	SW-846 6010
BV53-046	751997.513	2081807.246	0.00	0.25	Lead	68.00	1000	54.62	mg/kg	SW-846 6010
BV53-047	752006.703	2081845.118	0.00	0.25	Antimony	1.50	409	0.47	mg/kg	SW-846 6010

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BV53-047	752006.703	2081845.118	0.00	0.25	Copper	20.00	40900	18.06	mg/kg	SW-846 6010
BV53-047	752006.703	2081845.118	0.00	0.25	Lead	650.00	1000	54.62	mg/kg	SW-846 6010
BV53-048	752031.504	2081820.146	0.00	0.25	Antimony	0.75	409	0.47	mg/kg	SW-846 6010
BV53-048	752031.504	2081820.146	0.00	0.25	Copper	34.00	40900	18.06	mg/kg	SW-846 6010
BV53-048	752031.504	2081820.146	0.00	0.25	Lead	210.00	1000	54.62	mg/kg	SW-846 6010
BV53-049	752072.623	2081819.529	0.00	0.25	Antimony	1.20	409	0.47	mg/kg	SW-846 6010
BV53-049	752072.623	2081819.529	0.00	0.25	Lead	110.00	1000	54.62	mg/kg	SW-846 6010
BV53-049	752072.623	2081819.529	0.00	0.25	Tin	22.00	613000	2.90	mg/kg	SW-846 6010
BV53-050	752075.844	2081831.666	0.00	0.25	Antimony	2.60	409	0.47	mg/kg	SW-846 6010
BV53-050	752075.844	2081831.666	0.00	0.25	Copper	65.00	40900	18.06	mg/kg	SW-846 6010
BV53-050	752075.844	2081831.666	0.00	0.25	Lead	440.00	1000	54.62	mg/kg	SW-846 6010
BV53-050	752075.844	2081831.666	0.00	0.25	Mercury	0.34	25200	0.13	mg/kg	SW-846 6010
BV53-051	752126.706	2081815.103	0.00	0.25	Antimony	0.66	409	0.47	mg/kg	SW-846 6010
BV53-052	752095.858	2081892.105	0.00	0.25	Antimony	1.90	409	0.47	mg/kg	SW-846 6010
BV53-052	752095.858	2081892.105	0.00	0.25	Copper	250.00	40900	18.06	mg/kg	SW-846 6010
BV53-052	752095.858	2081892.105	0.00	0.25	Lead	290.00	1000	54.62	mg/kg	SW-846 6010
BV53-053	752099.592	2081906.349	0.00	0.25	Antimony	1.40	409	0.47	mg/kg	SW-846 6010
BV53-053	752099.592	2081906.349	0.00	0.25	Copper	48.00	40900	18.06	mg/kg	SW-846 6010
BV53-053	752099.592	2081906.349	0.00	0.25	Lead	210.00	1000	54.62	mg/kg	SW-846 6010
BV53-054	752100.874	2081914.156	0.00	0.25	Aluminum	17000.00	228000	16902.00	mg/kg	SW-846 6010
BV53-054	752100.874	2081914.156	0.00	0.25	Antimony	3.40	409	0.47	mg/kg	SW-846 6010
BV53-054	752100.874	2081914.156	0.00	0.25	Chromium	19.00	268	16.99	mg/kg	SW-846 6010
BV53-054	752100.874	2081914.156	0.00	0.25	Copper	140.00	40900	18.06	mg/kg	SW-846 6010
BV53-054	752100.874	2081914.156	0.00	0.25	Lead	520.00	1000	54.62	mg/kg	SW-846 6010
BV53-054	752100.874	2081914.156	0.00	0.25	Nickel	16.00	20400	14.91	mg/kg	SW-846 6010
BV53-055	752073.505	2081935.635	0.00	0.25	Antimony	38.00	409	0.47	mg/kg	SW-846 6010
BV53-055	752073.505	2081935.635	0.00	0.25	Arsenic	12.00	22.2	10.09	mg/kg	SW-846 6010
BV53-055	752073.505	2081935.635	0.00	0.25	Copper	5200.00	40900	18.06	mg/kg	SW-846 6010
BV53-055	**752073.505**	**2081935.635**	**0.00**	**0.25**	**Lead**	**6200.00**	**1000**	**54.62**	**mg/kg**	**SW-846 6010**

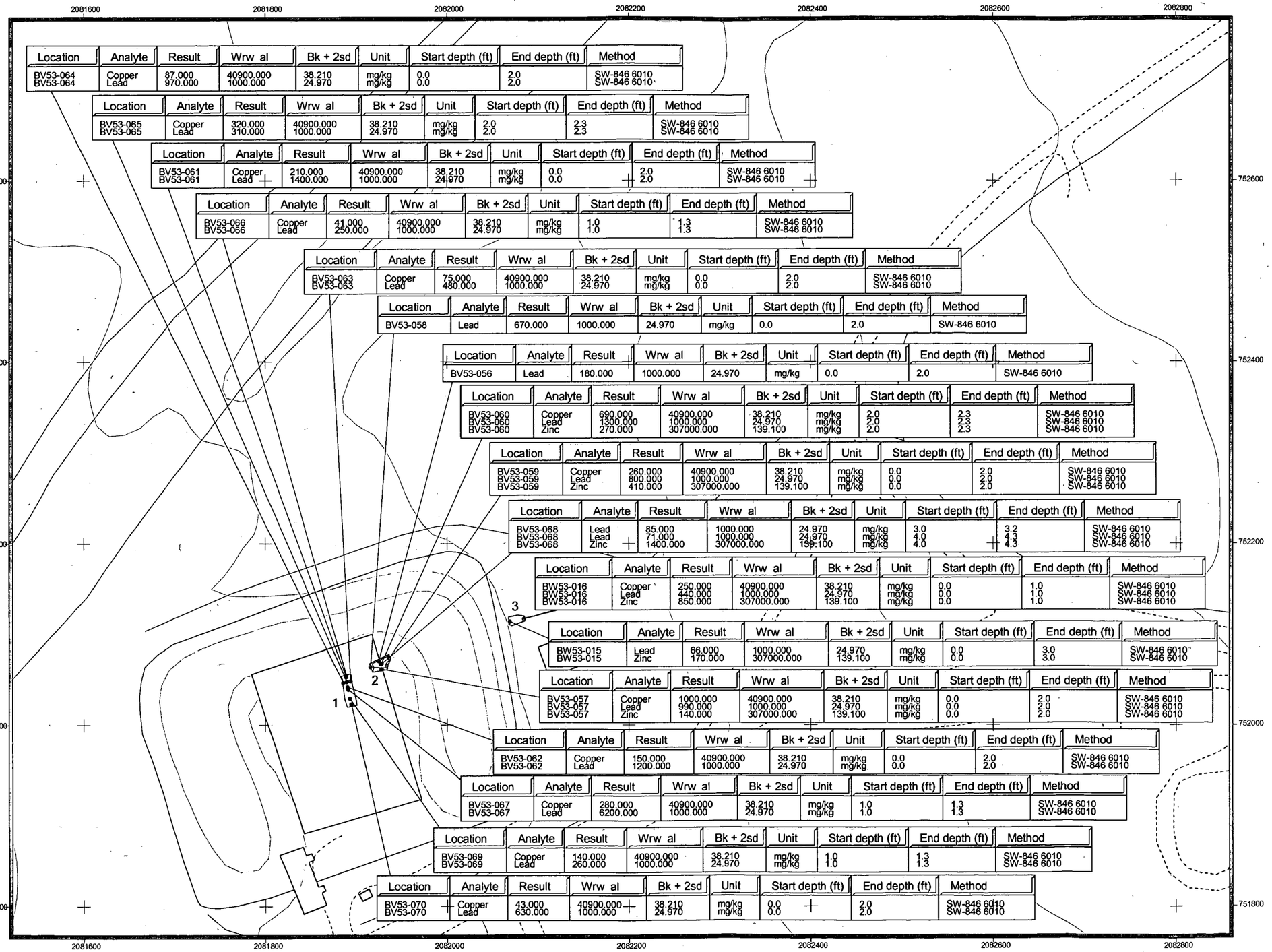
Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BV53-055	752073.505	2081935.635	0.00	0.25	Selenium	1.40	5110	1.22	mg/kg	SW-846 6010
BV53-055	752073.505	2081935.635	0.00	0.25	Tin	14.00	613000	2.90	mg/kg	SW-846 6010
BV53-055	752073.505	2081935.635	0.00	0.25	Zinc	430.00	307000	73.76	mg/kg	SW-846 6010
BV54-000	**752189.857**	**2081923.550**	**0.00**	**0.50**	**Arsenic**	**22.40**	**22.2**	**10.09**	**mg/kg**	**SW-846 6200**
BV54-000	752189.857	2081923.550	0.00	0.50	Barium	742.00	26400	141.26	mg/kg	SW-846 6200
BV54-000	752189.857	2081923.550	0.00	0.50	Chromium	44.80	268	16.99	mg/kg	SW-846 6200
BV54-000	752189.857	2081923.550	0.00	0.50	Iron	40300.00	307000	18037.00	mg/kg	SW-846 6200
BV54-000	752189.857	2081923.550	0.00	0.50	Manganese	446.00	3480	365.08	mg/kg	SW-846 6200
BV54-000	752189.857	2081923.550	0.00	0.50	Nickel	47.50	20400	14.91	mg/kg	SW-846 6200
BV54-000	752189.857	2081923.550	0.00	0.50	Strontium	184.00	613000	48.94	mg/kg	SW-846 6200
BV54-000	752189.857	2081923.550	0.50	2.50	Barium	645.00	26400	289.38	mg/kg	SW-846 6200
BW53-000	752126.936	2081944.960	0.00	0.50	Arsenic	21.30	22.2	10.09	mg/kg	SW-846 6200
BW53-000	752126.936	2081944.960	0.00	0.50	Barium	804.00	26400	141.26	mg/kg	SW-846 6200
BW53-000	752126.936	2081944.960	0.00	0.50	Chromium	38.30	268	16.99	mg/kg	SW-846 6200
BW53-000	752126.936	2081944.960	0.00	0.50	Iron	34300.00	307000	18037.00	mg/kg	SW-846 6200
BW53-000	752126.936	2081944.960	0.00	0.50	Nickel	45.50	20400	14.91	mg/kg	SW-846 6200
BW53-000	752126.936	2081944.960	0.00	0.50	Strontium	189.00	613000	48.94	mg/kg	SW-846 6200
BW53-001	752114.494	2082072.144	0.00	0.50	Antimony	16.00	409	0.47	mg/kg	SW-846 6010
BW53-001	752114.494	2082072.144	0.00	0.50	Arsenic	13.00	22.2	10.09	mg/kg	SW-846 6010
BW53-001	752114.494	2082072.144	0.00	0.50	Chromium	19.00	268	16.99	mg/kg	SW-846 6010
BW53-001	752114.494	2082072.144	0.00	0.50	Copper	1100.00	40900	18.06	mg/kg	SW-846 6010
BW53-001	**752114.494**	**2082072.144**	**0.00**	**0.50**	**Lead**	**3500.00**	**1000**	**54.62**	**mg/kg**	**SW-846 6010**
BW53-001	752114.494	2082072.144	0.00	0.50	Selenium	1.30	5110	1.22	mg/kg	SW-846 6010
BW53-001	752114.494	2082072.144	0.00	0.50	Tin	4.50	613000	2.90	mg/kg	SW-846 6010
BW53-001	752114.494	2082072.144	0.00	0.50	Zinc	720.00	307000	73.76	mg/kg	SW-846 6010
BW53-002	752201.608	2081991.468	0.00	0.50	Arsenic	18.10	22.2	10.09	mg/kg	SW-846 6200
BW53-002	752201.608	2081991.468	0.00	0.50	Barium	798.00	26400	141.26	mg/kg	SW-846 6200
BW53-002	752201.608	2081991.468	0.00	0.50	Chromium	52.40	268	16.99	mg/kg	SW-846 6200
BW53-002	752201.608	2081991.468	0.00	0.50	Iron	37000.00	307000	18037.00	mg/kg	SW-846 6200

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BW53-002	752201.608	2081991.468	0.00	0.50	Manganese	451.00	3480	365.08	mg/kg	SW-846 6200
BW53-002	752201.608	2081991.468	0.00	0.50	Nickel	48.10	20400	14.91	mg/kg	SW-846 6200
BW53-002	752201.608	2081991.468	0.00	0.50	Strontium	183.00	613000	48.94	mg/kg	SW-846 6200
BW53-002	752201.608	2081991.468	0.00	0.50	Tin	12.20	613000	2.90	mg/kg	SW-846 6200
BW53-002	752201.608	2081991.468	0.00	0.50	Vanadium	94.10	7150	45.59	mg/kg	SW-846 6200
BW53-010	752072.748	2081950.800	0.00	0.25	Antimony	1.60	409	0.47	mg/kg	SW-846 6010
BW53-010	752072.748	2081950.800	0.00	0.25	Copper	41.00	40900	18.06	mg/kg	SW-846 6010
BW53-010	752072.748	2081950.800	0.00	0.25	Lead	200.00	1000	54.62	mg/kg	SW-846 6010
BW53-018	752085.277	2081976.957	9.00	9.30	Zinc	420.00	307000	139.10	mg/kg	SW-846 6010
BW53-019	752093.512	2082004.884	21.50	21.80	Copper	93.00	40900	38.21	mg/kg	SW-846 6010
BW53-019	752093.512	2082004.884	21.50	21.80	Lead	160.00	1000	24.97	mg/kg	SW-846 6010
BW53-020	752102.391	2082035.758	9.00	9.30	Lead	90.00	1000	24.97	mg/kg	SW-846 6010
BW54-001	752170.240	2081989.772	0.00	0.50	Arsenic	19.80	22.2	10.09	mg/kg	SW-846 6200
BW54-001	752170.240	2081989.772	0.00	0.50	Barium	778.00	26400	141.26	mg/kg	SW-846 6200
BW54-001	752170.240	2081989.772	0.00	0.50	Chromium	45.50	268	16.99	mg/kg	SW-846 6200
BW54-001	752170.240	2081989.772	0.00	0.50	Iron	41800.00	307000	18037.00	mg/kg	SW-846 6200
BW54-001	752170.240	2081989.772	0.00	0.50	Nickel	54.40	20400	14.91	mg/kg	SW-846 6200
BW54-001	752170.240	2081989.772	0.00	0.50	Strontium	182.00	613000	48.94	mg/kg	SW-846 6200
BW54-001	752170.240	2081989.772	0.00	0.50	Vanadium	94.90	7150	45.59	mg/kg	SW-846 6200
BW54-001	752170.240	2081989.772	0.00	0.50	Zinc	95.20	307000	73.76	mg/kg	SW-846 6200
BW54-002	752201.242	2081959.586	0.00	0.50	Arsenic	17.30	22.2	10.09	mg/kg	SW-846 6200
BW54-002	752201.242	2081959.586	0.00	0.50	Barium	781.00	26400	141.26	mg/kg	SW-846 6200
BW54-002	752201.242	2081959.586	0.00	0.50	Chromium	37.60	268	16.99	mg/kg	SW-846 6200
BW54-002	752201.242	2081959.586	0.00	0.50	Iron	33800.00	307000	18037.00	mg/kg	SW-846 6200
BW54-002	752201.242	2081959.586	0.00	0.50	Manganese	501.00	3480	365.08	mg/kg	SW-846 6200
BW54-002	752201.242	2081959.586	0.00	0.50	Nickel	41.50	20400	14.91	mg/kg	SW-846 6200
BW54-002	752201.242	2081959.586	0.00	0.50	Strontium	190.00	613000	48.94	mg/kg	SW-846 6200
BW54-002	752201.242	2081959.586	0.00	0.50	Vanadium	101.00	7150	45.59	mg/kg	SW-846 6200
BW54-002	752201.242	2081959.586	0.50	2.50	Arsenic	18.30	22.2	13.14	mg/kg	SW-846 6200

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BW54-002	752201.242	2081959.586	0.50	2.50	Barium	852.00	26400	289.38	mg/kg	SW-846 6200
BW54-002	752201.242	2081959.586	0.50	2.50	Iron	42300.00	307000	41046.52	mg/kg	SW-846 6200
BW54-002	752201.242	2081959.586	0.50	2.50	Nickel	67.40	20400	62.21	mg/kg	SW-846 6200
BW54-002	752201.242	2081959.586	0.50	2.50	Vanadium	136.00	7150	88.49	mg/kg	SW-846 6200
BW54-003	752199.769	2081994.951	0.00	0.50	Arsenic	16.60	22.2	10.09	mg/kg	SW-846 6200
BW54-003	752199.769	2081994.951	0.00	0.50	Barium	807.00	26400	141.26	mg/kg	SW-846 6200
BW54-003	752199.769	2081994.951	0.00	0.50	Chromium	50.30	268	16.99	mg/kg	SW-846 6200
BW54-003	752199.769	2081994.951	0.00	0.50	Iron	35200.00	307000	18037.00	mg/kg	SW-846 6200
BW54-003	752199.769	2081994.951	0.00	0.50	Manganese	411.00	3480	365.08	mg/kg	SW-846 6200
BW54-003	752199.769	2081994.951	0.00	0.50	Nickel	44.50	20400	14.91	mg/kg	SW-846 6200
BW54-003	752199.769	2081994.951	0.00	0.50	Strontium	169.00	613000	48.94	mg/kg	SW-846 6200
BW54-003	752199.769	2081994.951	0.50	2.50	Barium	817.00	26400	289.38	mg/kg	SW-846 6200
BW54-003	752199.769	2081994.951	0.50	2.50	Vanadium	102.00	7150	88.49	mg/kg	SW-846 6200
BW54-004	752161.619	2081955.022	0.00	0.25	Aluminum	18000.00	228000	16902.00	mg/kg	SW-846 6010
BW54-004	752161.619	2081955.022	0.00	0.25	Beryllium	0.97	921	0.97	mg/kg	SW-846 6010
In Process and Confirmation Samples										
BV53-056	752070.622	2081924.925	0.0	2.0	Lead	180.00	1000	24.97	mg/kg	SW-846 6010
BV53-057	752061.728	2081928.012	0.0	2.0	Copper	1000.00	40900	38.21	mg/kg	SW-846 6010
BV53-057	752061.728	2081928.012	0.0	2.0	Lead	990.00	1000	24.97	mg/kg	SW-846 6010
BV53-057	752061.728	2081928.012	0.0	2.0	Zinc	140.00	307000	139.10	mg/kg	SW-846 6010
BV53-058	752064.135	2081915.743	0.0	2.0	Lead	670.00	1000	24.97	mg/kg	SW-846 6010
BV53-059	752074.128	2081936.547	0.0	2.0	Copper	260.00	40900	38.21	mg/kg	SW-846 6010
BV53-059	752074.128	2081936.547	0.0	2.0	Lead	800.00	1000	24.97	mg/kg	SW-846 6010
BV53-059	752074.128	2081936.547	0.0	2.0	Zinc	410.00	307000	139.10	mg/kg	SW-846 6010
BV53-060	752067.347	2081927.503	2.0	2.3	Copper	690.00	40900	38.21	mg/kg	SW-846 6010
BV53-060	**752067.347**	**2081927.503**	**2.0**	**2.3**	**Lead**	**1300.00**	**1000**	**24.97**	**mg/kg**	**SW-846 6010**
BV53-060	752067.347	2081927.503	2.0	2.3	Zinc	270.00	307000	139.10	mg/kg	SW-846 6010
BV53-061	752052.973	2081888.953	0.0	2.0	Copper	210.00	40900	38.21	mg/kg	SW-846 6010
BV53-061	**752052.973**	**2081888.953**	**0.0**	**2.0**	**Lead**	**1400.00**	**1000**	**24.97**	**mg/kg**	**SW-846 6010**

Location	Actual Northing	Actual Easting	Starting Depth (ft)	Ending Depth (ft)	Analyte	Result	WRW AL	Background Mean Plus 2 SD	Unit	Method
BV53-062	752041.875	2081890.497	0.0	2.0	Copper	150.00	40900	38.21	mg/kg	SW-846 6010
BV53-062	**752041.875**	**2081890.497**	**0.0**	**2.0**	**Lead**	**1200.00**	**1000**	**24.97**	**mg/kg**	**SW-846 6010**
BV53-063	752048.423	2081893.899	0.0	2.0	Copper	75.00	40900	38.21	mg/kg	SW-846 6010
BV53-063	752048.423	2081893.899	0.0	2.0	Lead	480.00	1000	24.97	mg/kg	SW-846 6010
BV53-064	752046.628	2081885.692	0.0	2.0	Copper	87.00	40900	38.21	mg/kg	SW-846 6010
BV53-064	752046.628	2081885.692	0.0	2.0	Lead	970.00	1000	24.97	mg/kg	SW-846 6010
BV53-065	752047.592	2081889.646	2.0	2.3	Copper	320.00	40900	38.21	mg/kg	SW-846 6010
BV53-065	752047.592	2081889.646	2.0	2.3	Lead	310.00	1000	24.97	mg/kg	SW-846 6010
BV53-066	752054.770	2081888.982	1.0	1.3	Copper	41.00	40900	38.21	mg/kg	SW-846 6010
BV53-066	752054.770	2081888.982	1.0	1.3	Lead	250.00	1000	24.97	mg/kg	SW-846 6010
BV53-067	752039.203	2081891.599	1.0	1.3	Copper	280.00	40900	38.21	mg/kg	SW-846 6010
BV53-067	**752039.203**	**2081891.599**	**1.0**	**1.3**	**Lead**	**6200.00**	**1000**	**24.97**	**mg/kg**	**SW-846 6010**
BV53-068	752067.502	2081928.144	3.0	3.2	Lead	85.00	1000	24.97	mg/kg	SW-846 6010
BV53-068	752067.502	2081928.144	4.0	4.3	Lead	71.00	1000	24.97	mg/kg	SW-846 6010
BV53-068	752067.502	2081928.144	4.0	4.3	Zinc	1400.00	307000	139.10	mg/kg	SW-846 6010
BV53-069	752029.197	2081893.257	1.0	1.3	Copper	140.00	40900	38.21	mg/kg	SW-846 6010
BV53-069	752029.197	2081893.257	1.0	1.3	Lead	260.00	1000	24.97	mg/kg	SW-846 6010
BV53-070	752022.638	2081894.843	0.0	2.0	Copper	43.00	40900	38.21	mg/kg	SW-846 6010
BV53-070	752022.638	2081894.843	0.0	2.0	Lead	630.00	1000	24.97	mg/kg	SW-846 6010
BW53-015	752114.114	2082069.393	0.0	3.0	Lead	66.00	1000	24.97	mg/kg	SW-846 6010
BW53-015	752114.114	2082069.393	0.0	3.0	Zinc	170.00	307000	139.10	mg/kg	SW-846 6010
BW53-016	752116.986	2082085.057	0.0	1.0	Copper	250.00	40900	38.21	mg/kg	SW-846 6010
BW53-016	752116.986	2082085.057	0.0	1.0	Lead	440.00	1000	24.97	mg/kg	SW-846 6010
BW53-016	752116.986	2082085.057	0.0	1.0	Zinc	850.00	307000	139.10	mg/kg	SW-846 6010

Bold denotes AL exceedance.



Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-064	Copper	87.000	40900.000	38.210	mg/kg	0.0	2.0	SW-846 6010
BV53-064	Lead	970.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-065	Copper	320.000	40900.000	38.210	mg/kg	2.0	2.3	SW-846 6010
BV53-065	Lead	310.000	1000.000	24.970	mg/kg	2.0	2.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-061	Copper	210.000	40900.000	38.210	mg/kg	0.0	2.0	SW-846 6010
BV53-061	Lead	1400.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-066	Copper	41.000	40900.000	38.210	mg/kg	1.0	1.3	SW-846 6010
BV53-066	Lead	250.000	1000.000	24.970	mg/kg	1.0	1.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-063	Copper	75.000	40900.000	38.210	mg/kg	0.0	2.0	SW-846 6010
BV53-063	Lead	480.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-058	Lead	670.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-056	Lead	180.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-060	Copper	690.000	40900.000	38.210	mg/kg	2.0	2.3	SW-846 6010
BV53-060	Lead	1300.000	1000.000	24.970	mg/kg	2.0	2.3	SW-846 6010
BV53-060	Zinc	270.000	307000.000	139.100	mg/kg	2.0	2.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-059	Copper	260.000	40900.000	38.210	mg/kg	0.0	2.0	SW-846 6010
BV53-059	Lead	800.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010
BV53-059	Zinc	410.000	307000.000	139.100	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-068	Lead	85.000	1000.000	24.970	mg/kg	3.0	3.2	SW-846 6010
BV53-068	Lead	71.000	1000.000	24.970	mg/kg	4.0	4.3	SW-846 6010
BV53-068	Zinc	1400.000	307000.000	139.100	mg/kg	4.0	4.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW53-016	Copper	250.000	40900.000	38.210	mg/kg	0.0	1.0	SW-846 6010
BW53-016	Lead	440.000	1000.000	24.970	mg/kg	0.0	1.0	SW-846 6010
BW53-016	Zinc	850.000	307000.000	139.100	mg/kg	0.0	1.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW53-015	Lead	66.000	1000.000	24.970	mg/kg	0.0	3.0	SW-846 6010
BW53-015	Zinc	170.000	307000.000	139.100	mg/kg	0.0	3.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-057	Copper	1000.000	40900.000	38.210	mg/kg	0.0	2.0	SW-846 6010
BV53-057	Lead	990.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010
BV53-057	Zinc	140.000	307000.000	139.100	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-062	Copper	150.000	40900.000	38.210	mg/kg	0.0	2.0	SW-846 6010
BV53-062	Lead	1200.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-067	Copper	280.000	40900.000	38.210	mg/kg	1.0	1.3	SW-846 6010
BV53-067	Lead	6200.000	1000.000	24.970	mg/kg	1.0	1.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-069	Copper	140.000	40900.000	38.210	mg/kg	1.0	1.3	SW-846 6010
BV53-069	Lead	260.000	1000.000	24.970	mg/kg	1.0	1.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk + 2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-070	Copper	43.000	40900.000	38.210	mg/kg	0.0	2.0	SW-846 6010
BV53-070	Lead	630.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010

Figure 5
IHSS Group NE-1 North Firing Range (PAC NW-1505) In Process and Confirmation Soil Sampling Results Greater than Background Means Plus Two Standard Deviations

KEY

- Sampling location with result greater than background means plus two standard deviations
- Sampling location with result greater than wildlife refuge worker action level
- 1 Excavation boundary reference
- Excavation Boundary
- PAC NW-1505
- Structure removed at PAC NW-1505
- Dirt road
- Stream
- Pond
- Topographic contour 5 ft

N W E S

50 0 50 Feet

Scale = 1: 1350

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: RADMS Date: 04.26.05

Prepared for: KAISER•HILL COMPANY

File: W:\Projects\FY2005\NE-1_North_Firing_Range\nfr_cor_041305.apr

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2.4 SORs

Nonradionuclide Sums of Ratios (SORs) for all surface soil samples (0 to 0.5 ft) were calculated where analyte concentrations were 10 percent or more of a contaminant's WRW AL. Aluminum, arsenic, iron, manganese and no longer representative (NLR) samples were not included in the SOR calculations. Table 4 shows that no sample location SOR calculation was greater than one.

Table 4
IHSS Group NE-1, North Firing Range (PAC NW-1505)
Nonradionuclide SORs for Surface Soil

Location	Starting Depth (ft)	Ending Depth (ft)	SOR
BU52-000	0	0.5	0.16
BU52-001	0	0.5	0.23
BU53-000	0	0.5	0.24
BU53-002	0	0.5	0.16
BU53-004	0	0.5	0.17
BV53-000	0	0.5	0.14
BV53-001	0	0.5	0.13
BV53-003	0	0.5	0.14
BV53-004	0	0.5	0.19
BV53-005	0	0.5	0.18
BV53-007	0	0.5	0.34
BV53-008	0	0.5	0.36
BV53-009	0	0.5	0.11
BV53-010	0	0.5	0.27
BV53-012	0	0.5	0.12
BV53-013	0	0.5	0.52
BV53-014	0	0.5	0.78
BV53-015	0	0.5	0.50
BV53-016	0	0.5	0.86
BV53-017	0	0.5	0.12
BV53-018	0	0.5	0.75
BV53-019	0	0.5	0.16
BV53-022	0	0.5	0.14
BV53-023	0	0.5	0.13
BV53-024	0	0.5	0.19
BV53-025	0	0.5	0.32
BV53-032	0	0.5	0.74
BV53-033	0	0.5	0.14
BV53-035	0	0.5	0.32
BV53-037	0	0.5	0.13
BV53-038	0	0.5	0.14
BV53-039	0	0.5	0.18
BV53-040	0	0.5	0.18
BV53-041	0	0.5	0.19
BV53-042	0	0.5	0.15
BV53-045	0	0.25	0.44
BV53-047	0	0.25	0.65

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Location	Starting Depth (ft)	Ending Depth (ft)	SOR
BV53-048	0	0.25	0.21
BV53-049	0	0.25	0.11
BV53-050	0	0.25	0.44
BV53-052	0	0.25	0.29
BV53-053	0	0.25	0.21
BV53-054	0	0.25	0.52
BV54-000	0	0.5	0.17
BW53-000	0	0.5	0.14
BW53-002	0	0.5	0.20
BW53-010	0	0.25	0.20
BW54-001	0	0.5	0.17
BW54-002	0	0.5	0.14
BW54-003	0	0.5	0.19

3.0 SUMMARY STATISTICS

Summary statistics, by analyte, were calculated for the IHSS Group NE-1, North Firing Range (PAC NW-1505) surface soil and subsurface soil sampling locations (Tables 5 and 6, respectively). These summaries are based on detected concentrations for metals above-background means plus two standard deviations. These summary statistics are calculated using both SW-846 6200 and SW-846 6010 methods when applicable.

Table 5
Surface Soil Summary Statistics

Analyte	Number of Samples	Detection Frequency	Average Concentration	Maximum Concentration	WRW AL	Background Mean Plus 2SD	Unit
Aluminum	23	39.13%	18222.22	22000.00	228000	16902.00	mg/kg
Antimony	61	37.70%	8.06	38.00	409	0.47	mg/kg
Arsenic	61	62.30%	36.70	131.00	22.2	10.09	mg/kg
Barium	61	62.30%	775.58	958.00	26400	141.26	mg/kg
Beryllium	23	17.39%	1.01	1.10	921	0.97	mg/kg
Chromium	61	68.85%	40.22	60.50	268	16.99	mg/kg
Cobalt	61	16.39%	11.93	13.20	1550	10.91	mg/kg
Copper	61	24.59%	469.20	5200.00	40900	18.06	mg/kg
Iron	61	62.30%	36300.00	42100.00	307000	18037.00	mg/kg
Lead	61	52.46%	612.30	6200.00	1000	54.62	mg/kg
Lithium	23	8.70%	13.00	14.00	20400	11.55	mg/kg
Manganese	61	13.11%	481.50	642.00	3480	365.08	mg/kg
Mercury	61	3.28%	1.57	2.80	25200	0.13	mg/kg
Nickel	61	67.21%	44.53	58.20	20400	14.91	mg/kg
Selenium	61	11.48%	6.04	20.90	5110	1.22	mg/kg
Strontium	61	60.66%	179.38	245.00	613000	48.94	mg/kg
Tin	61	13.11%	12.54	22.00	613000	2.90	mg/kg
Vanadium	61	45.90%	89.68	105.00	7150	45.59	mg/kg
Zinc	61	21.31%	160.79	720.00	307000	73.76	mg/kg

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Table 6
Subsurface Soil Summary Statistics

Analyte	Number of Samples	Detection Frequency	Average Concentration	Maximum Concentration	WRW AL	Background Mean Plus 2SD	Unit
Arsenic	34	8.82%	18.00	19.90	22.2	13.14	mg/kg
Barium	34	26.47%	703.22	856.00	26400	289.38	mg/kg
Copper	34	41.18%	259.93	1000.00	40900	38.21	mg/kg
Iron	34	2.94%	42300.00	42300.00	307000	41046.52	mg/kg
Lead	34	58.82%	827.60	6200.00	1000	24.97	mg/kg
Nickel	34	2.94%	67.40	67.40	20400	62.21	mg/kg
Vanadium	34	11.76%	110.95	136.00	7150	88.49	mg/kg
Zinc	34	20.59%	522.86	1400.00	307000	139.10	mg/kg

4.0 ACCELERATED ACTION

Accelerated action objectives were developed for IHSS Group NE-1, North Firing Range (PAC NW-1505) and are described in ER RSOP Notification #05-05 (DOE 2005a). The ER RSOP remedial action objectives (RAOs) included the following:

- Provide a remedy consistent with the RFETS goal of protection of human health and the environment;
- Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls; and
- Minimize the spread of contaminants during implementation of accelerated actions.

ER accelerated action activities were conducted between October 26, 2004 and April 11, 2005. Starting and ending dates of significant activities are listed in Table 7. Photographs of site activities are presented in Appendix B. All accelerated action objectives were achieved. Removal activities are described below.

Table 7
IHSS Group NE-1, North Firing Range (PAC NW-1505) Dates of Accelerated Action Activities

Activity	Starting Date	Ending Date	Duration
Accelerated action characterization sampling	10/26/2004	03/28/2005	168 days
Accelerated action removal activities and confirmation sampling	03/29/2005	4/11/2005	14 days

4.1 Soil Removal

Approximately 32 cubic yards (cy) of soil were excavated and disposed from IHSS Group NE-1, North Firing Range (PAC NW-1505). The areal extent of the excavation was approximately 522 square feet (ft^2). The hazardous waste filled five dirt, rubble and trash (DRT) bags. The three distinct areas of excavation that were identified in Notification #05-05

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have been labeled from west to east as one, two and three, respectively (see Figure 5 and 6). All three of the excavations were inititiated on March 29, 2005. After each excavation event, five samples, one from each sideslopes and one from the bottom were collected, analyzed for metals, and then compared against the appropriate ALs. Figure 5 shows the areal extent of the three excavations.

Excavation area one (the western most excavation), was excavated in four distinct events before sampling confirmed that the hotspot had been successfully remediated. Excavation area two, the middle excavation, was successfully remediated with two distinct events, while area three's excavation, the eastern most area, was successfully completed upon its first excavation event. As stated in the April 12, 2005 ER Regulatory Contact Record, the affected areas were subsequently backfilled once all hotspot remediation was determined to be less than ALs.

4.2 Site Reclamation

If the results of the CRA indicate that actions are not required for ecological receptors, the berm will be pushed in and the Site regraded.

5.0 CONFIRMATION SAMPLING

Excavation Area Number One

Excavation area number one required four different excavation events before being deemed complete. The remaining and representative confirmation sample locations are BV53-066, -070, -063, -064 and -065. These locations represent confirmation samples collected on the north, south, west, east sideslopes, and the center bottom of the excavation, respectively. Sample results greater than background means plus two standard deviations are shown on Figure 5.

Excavation Area Number Two

Excavation area number two required two different events before being deemed complete. The remaining and representative confirmation sample locations are BV53-056, -057, -058, -059 and -068. These locations represent confirmation samples collected on the north, south, west, east sideslopes, and the center bottom of the excavation, respectively. Sample results greater than background means plus two standard deviations are shown on Figure 5.

Excavation Area Number Three

Excavation area number three required only one event before being deemed complete. The remaining and representative confirmation sample locations are BW53-013, -014, -015, -016 and -017. These locations represent confirmation samples collected on the north, south, west, east sideslopes, and the center bottom of the excavation, respectively. Sample results greater than background means plus two standard deviations are shown on Figure 5.

Culvert Removal

A drainage culvert was present between excavation areas two and three. The culvert was removed as part of the ER RSOP Notification #05-05 (DOE 2005a). Three samples were collected at the completion of the culvert removal. Sample location BW53-018 was taken at the west end of the culvert; BW53-019 was taken in the middle of the culvert; and

BW53-020 was taken at the east end of where the culvert was located. Results from all three culvert sample locations were below WRW ALs.

6.0 RCRA UNIT CLOSURE

Not applicable. There were no Resource Conservation and Recovery Act (RCRA) units to be closed at IHSS Group NE-1, North Firing Range (PAC NW-1505).

7.0 SUBSURFACE SOIL RISK SCREEN

The Subsurface Soil Risk Screen (SSRS) follows the steps identified on Figure 3 in Attachment 5 of RFCA (DOE et al. 2003).

Screen 1 – Are the COC concentrations below Table 3 WRW soil ALs?

No. All remaining residual subsurface soil contaminant concentrations are less than WRW ALs except for arsenic analyzed using EPA method SW-846 6200.

Based on the accelerated action sampling, all subsurface metal concentrations were below the WRW ALs except for arsenic. Ten locations (BU53-001, BU53-002, BV53-038, BV53-039, BV53-040, BV53-041, BV53-042, BV54-000, BW54-002, and BW54-003, Figure 3) across the north side of the north berm were sampled from 0.5 to 2.5 feet and analyzed using EPA SW-846 6200 method and five of the ten locations exhibited arsenic concentrations greater than the WRW AL (BU53-001, BU53-002, BV53-041, BV53-042, and BV54-000). In accordance with ER RSOP Notification #05-05 it was agreed that the North Firing Range remediation of arsenic WRW AL exceedances analyzed using the SW-846 6200 methodology was not warranted. As shown in Table 1 in the ER RSOP #05-05, arsenic concentrations determined using the SW-846 6200 method (on-site, x-ray fluorescence [XRF]) are up to several orders of magnitude greater than those determined using SW-846 6010, a more accurate method (off-site, inductively coupled plasma [ICP] spectrometry) (DOE 2005a). Method SW-846 6200 results were used for evaluating metals other than arsenic.

Screen 2 – Is there potential for subsurface soil to become surface soil (landslide and erosion areas identified on Figure 1)?

No. IHSS Group NE-1, North Firing Range (PAC NW-1505) does not lie in an area identified for high erosion or landslide potential. However, changes to sample locations and depths will occur when the area is regraded using the berm material. Subsurface samples could become surface soil samples, and vice versa. The potential exists for other samples to be covered by this material, thus causing changes to locations and depths.

Screen 3 – Does subsurface soil radiological contamination exceeed criteria in Section 5.3?

No. Radionuclides were not COCs for IHSS Group NE-1, North Firing Range (PAC NW-1505).

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Screen 4 – Is there an environmental pathway and sufficient quantity of COCs that would cause exceedance of the surface water standards?

No. IHSS Group NE-1, North Firing Range (PAC NW-1505) does not lie in an area that is prone to landslides or high erosion, as shown on RFCA Attachment 5, Figure 1 (DOE et al. 2003).

8.0 STEWARDSHIP ANALYSIS

The IHSS Group NE-1, North Firing Range (PAC NW-1505) stewardship evaluation was conducted through ongoing consultation with the regulatory agencies. Frequent informal project updates, e-mails, and telephone and personal contacts occurred throughout the project. Copies of Regulatory Contact Records are provided in Appendix A.

8.1 Current Site Conditions

North Firing Range excavation areas were backfilled once sample results deemed the remediation complete. Based upon the accelerated actions performed and analytical results of sampling, conditions at IHSS Group NE-1, North Firing Range (PAC NW-1505) include the following:

- The potential sources of contamination greater than WRW ALs were removed;
- All residual contaminant concentrations of lead are below RFCA WRW ALs; and
- IHSS Group NE-1, North Firing Range (PAC NW-1505) berm area will be regraded.

8.2 Near-Term Management Recommendations

IHSS Group-specific near-term management actions are listed below:

- Install erosion controls as necessary as part of land configuration.
- Excavation at the site will continue to be controlled through the Site Soil Disturbance Permit process;
- Access will be restricted; and
- Site access and the Soil Disturbance Permit process will remain in place pending implementation of long-term controls.

8.3 Long-Term Stewardship Recommendations

Based on remaining environmental conditions at IHSS Group NE-1, North Firing Range (PAC NW-1505), no IHSS Group- specific long-term stewardship activities are recommended beyond the generally applicable Site requirements or institutional controls that may be used as appropriate for this area include the following:

- Prohibitions on construction of buildings;
- Restrictions on excavation or other soil disturbance; and
- Prohibition on groundwater pumping in the area of IHSS Group NE-1, North Firing Range (PAC NW-1505).

Currently, none of the previously listed engineering controls or environmental monitoring are recommended as a result of the conditions remaining at IHSS Group NE-1, North Firing Range (PAC NW-1505). Likewise, no specific institutional or physical controls are recommended as a result of the conditions remaining at IHSS Group NE-1, North Firing Range (PAC NW-1505).

This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record (AR) file.

IHSS Group NE-1, North Firing Range (PAC NW-1505) will be evaluated as part of the Sitewide CRA. The CRA is part of the Remedial Investigation/Feasibility Study (RI/FS) that will be conducted for the Site. Potential surface water impacts and water quality monitoring requirements will be addressed in the CRA and RI/FS. The need for, and extent of any more general, long-term stewardship activities will also be analyzed in the RI/FS and proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for the Site will ultimately be contained in the Corrective Action Decision/Record of Decision (CAD/ROD) and any post-RFCA agreement.

9.0 DEVIATIONS FROM THE ER RSOP

Removal methods and objectives did not deviate from the ER RSOP FY05 Notification #05-05 (DOE 2005a) and subsequent consultative process modifications documented in Regulatory Contact Records (see Appendix A).

10.0 POST-ACCELERATED ACTION CONDITIONS

Residual metal concentrations, including arsenic, exist in the IHSS Group NE-1, North Firing Range (PAC NW-1505) that are greater than background means plus two standard deviations (Figure 6). Residual concentrations of lead are below the WRW AL.

11.0 WASTE MANAGEMENT

Approximately 32 cubic yards (cy) of soil was excavated and disposed from IHSS Group NE-1, North Firing Range (PAC NW-1505). The areal extent of the excavation was approximately 522 square feet (ft^2) and the hazardous waste filled five DRT bags. All excavated waste material was transferred to the Material Stewardship group for temporary storage and final disposal.

12.0 NLR SAMPLING LOCATIONS

The sampling locations designated NLR for IHSS Group NE-1, North Firing Range (PAC NW-1505) are listed in Table 8. NLR locations are flagged in the RFETS Soil Water Database (SWD) to ensure they will not be incorporated into the Sitewide CRA or other Site analyses.

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Table 8
IHSS Group NE-1, North Firing Range (PAC NW-1505) NLR Sampling Locations

Location	Northing	Easting	Media	Starting Depth (ft)	Ending Depth (ft)
Characterization Sampling Locations					
BV53-029	752073.364	2081935.683	Surface Soil	0	0.5
BV53-036	752049.114	2081889.829	Surface Soil	0	0.5
BV53-055	752073.505	2081935.635	Surface Soil	0	0.25
BW53-001	752114.494	2082072.144	Surface Soil	0	0.5
In Process Sampling Locations					
BV53-060	752067.347	2081927.503	Subsurface Soil	2	2.3
BV53-061	752052.973	2081888.953	Subsurface Soil	0	2
BV53-062	752041.875	2081890.497	Subsurface Soil	0	2
BV53-067	752039.203	2081891.599	Subsurface Soil	1	1.3
BV53-069	752029.197	2081893.257	Subsurface Soil	1	1.3

13.0 DATA QUALITY ASSESSMENT

The DQOs for this project are described in the IASAP (DOE 2001). All DQOs for this project were achieved based on the following:

- Regulatory agency-approved sampling program design in accordance with the IASAP (DOE 2001) and IABZSAP (DOE 2004b);
- Collection of samples in accordance with the sampling design;
- Implementation of remediation activities in accordance with ER RSOP Notification #05-05 (DOE 2005a); and
- Results of the DQA, as described in the following sections.

13.1 Data Quality Assessment Process

The DQA process ensures that the type, quantity, and quality of environmental data used in decision making are defensible, and is based on the following guidance and requirements:

- U.S. Environmental Protection Agency (EPA), 1994a, Guidance for the Data Quality Objective Process, QA/G-4;
- EPA, 1998, Guidance for the Data Quality Assessment Process, Practical Methods for Data Analysis, QA/G-9; and
- U.S. Department of Energy (DOE), 1999, Quality Assurance, Order 414.1A.

Verification and validation (V&V) of data are the primary components of the DQA. The final data are compared with original project DQOs and evaluated with respect to project decisions; uncertainty within the decisions; and quality criteria required for the data, specifically precision, accuracy, representativeness, completeness, comparability, and

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sensitivity (PARCCS). Validation criteria are consistent with the following RFETS-specific documents and industry guidelines:

- EPA, 1994b, US EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, 540/R-94/012;
- EPA, 1994c, US EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, 540/R-94/013;
- Kaiser-Hill Company, L.L.C. (K-H), 2002a, General Guidelines for Data Verification and Validation, DA-GR01-v2, October;
- K-H, 2002b, V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v2, October;
- K-H, 2002c, V&V Guidelines for Volatile Organics, DA-SS01-v3, October;
- K-H, 2002d, V&V Guidelines for Semivolatile Organics, DA-SS02-v3, October;
- K-H, 2002e, V&V Guidelines for Metals, DA-SS05-v3, October; and
- Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5.

This report will be submitted to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) AR for permanent storage 30 days after being provided to CDPHE and/or EPA.

13.2 Verification and Validation of Results

Verification ensures that data produced and used by the project are documented and traceable in accordance with quality requirements. Validation consists of a technical review of all data that directly support the project decisions so that any limitations of the data relative to project goals are delineated and the associated data are qualified accordingly. The V&V process defines the criteria that constitute data quality, namely PARCCS parameters. Data traceability and archival are also addressed. V&V criteria include the following:

- Chain-of-custody;
- Preservation and hold times;
- Instrument calibrations;
- Preparation blanks;
- Interference check samples (metals);
- Matrix spikes/matrix spike duplicates (MS/MSDs);
- Laboratory control samples (LCSs);

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- Field duplicate measurements;
- Chemical yield (radiochemistry);
- Required quantitation limits/minimum detectable activities (sensitivity of chemical and radiochemical measurements, respectively); and
- Sample analysis and preparation methods.

Evaluation of V&V criteria ensures that PARCCS parameters are satisfactory (that is, within tolerances acceptable to the project). Satisfactory V&V of laboratory quality controls are captured through application of validation "flags" or qualifiers to individual records.

Raw hard-copy data (for example, individual analytical data packages) are currently filed by report identification number (RIN) and maintained by K-H Analytical Services Division (ASD). Older hard copies may reside in the Federal Center in Lakewood, Colorado. Electronic data are stored in the RFETS SWD. Standardized real and QC data are included on the enclosed compact disk (CD).

13.2.1 Accuracy

The following measures of accuracy were evaluated:

- LCSs;
- Field blanks; and
- Sample MSs.

Results are compared to method requirements and project goals. The results of these comparisons are summarized for RFCA COCs where the results could impact project decisions. Particular attention is paid to those values near ALs when QC results could indicate unacceptable levels of uncertainty for decision-making purposes.

Laboratory Control Sample Evaluation

As indicated in Table 9, LCS analyses were run for method SW-846 6010.

Table 9
LCS Summary

Test Method	Laboratory Batch	LCS Run?
SW-846 6010	4302619	Yes
SW-846 6010	4303432	Yes
SW-846 6010	4306506	Yes
SW-846 6010	4309302	Yes
SW-846 6010	4314566	Yes
SW-846 6010	4315519	Yes
SW-846 6010	4322143	Yes
SW-846 6010	4323137	Yes
SW-846 6010	4324469	Yes
SW-846 6010	5040540	Yes
SW-846 6010	5042222	Yes

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Test Method	Laboratory Batch	LCS Run?
SW-846 6010	5088568	Yes
SW-846 6010	5089169	Yes
SW-846 6010	5091518	Yes
SW-846 6010	5094248	Yes
SW-846 6010	5095185	Yes
SW-846 6010	5095208	Yes
SW-846 6010	5095549	Yes
SW-846 6010	5096167	Yes
SW-846 6010	5096471	Yes
SW-846 6010	5097217	Yes
SW-846 6010	5101477	Yes
SW-846 6010	5102159	Yes

The minimum and maximum LCS results are tabulated, by chemical, for the entire project in Table 10. LCS results outside of tolerances were reviewed to determine whether a potential bias might be indicated. LCS recoveries are not indicative of matrix effects because they are not prepared using site samples. LCS results do indicate whether the laboratory may be introducing a bias in the results. Recoveries reported above the upper limit may indicate the actual sample results are less than reported. Because this is environmentally conservative, no further action is needed.

The analytes with unacceptably low recoveries are evaluated. If the highest sample result divided by the lowest LCS recovery for that analyte is less than the AL, no further action is taken because any indicated bias is not great enough to affect project decisions. LCS recoveries for this project were within tolerances; thus, no project decisions were affected.

Table 10
LCS Evaluation Summary

Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery
SW-846 6010	7429-90-5	Aluminum	87	102
SW-846 6010	7440-36-0	Antimony	86	94
SW-846 6010	7440-38-2	Arsenic	84	97
SW-846 6010	7440-39-3	Barium	93	104
SW-846 6010	7440-41-7	Beryllium	88	101
SW-846 6010	7440-43-9	Cadmium	88	100
SW-846 6010	7440-47-3	Chromium	89	102
SW-846 6010	7440-48-4	Cobalt	87	99
SW-846 6010	7440-50-8	Copper	93	103
SW-846 6010	7439-89-6	Iron	93	107
SW-846 6010	7439-92-1	Lead	89	100
SW-846 6010	7439-93-2	Lithium	93	101
SW-846 6010	7439-96-5	Manganese	90	101
SW-846 6010	7439-97-6	Mercury	90	110

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Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery
SW-846 6010	7439-98-7	Molybdenum	87	97
SW-846 6010	7440-02-0	Nickel	88	100
SW-846 6010	7782-49-2	Selenium	82	96
SW-846 6010	7440-22-4	Silver	93	105
SW-846 6010	7440-24-6	Strontium	92	102
SW-846 6010	7440-31-5	Tin	86	96
SW-846 6010	11-09-6	Uranium, Total	90	103
SW-846 6010	7440-62-2	Vanadium	89	101
SW-846 6010	7440-66-6	Zinc	86	96

Field Blank Evaluation

Results of the field blank analyses are given in Table 11. Detectable amounts of contaminants within the blanks, which could indicate possible cross-contamination of samples, are evaluated if the same contaminant is detected in the associated real samples. When the real result is less than 10 times the blank result for laboratory contaminants and 5 times the result for non-laboratory contaminants, the real result is eliminated. None of the chemicals were detected in the blanks at concentrations greater than one-tenth the AL. Therefore, blank contamination did not adversely impact project decisions.

Table 11
Field Blank Summary

Laboratory	CAS No.	Analyte	Sample QC Code	Detected Result	Unit
ESTLDEN	7429-90-5	Aluminum	FB	0.330	mg/L
ESTLDEN	7429-90-5	Aluminum	RNS	0.210	mg/L
ESTLDEN	7440-38-2	Arsenic	FB	0.004	mg/L
ESTLDEN	7440-39-3	Barium	FB	0.003	mg/L
ESTLDEN	7440-39-3	Barium	RNS	0.003	mg/L
ESTLDEN	7440-47-3	Chromium	FB	0.001	mg/L
ESTLDEN	7440-50-8	Copper	FB	0.005	mg/L
ESTLDEN	7440-50-8	Copper	RNS	0.005	mg/L
ESTLDEN	7439-89-6	Iron	FB	0.250	mg/L
ESTLDEN	7439-89-6	Iron	RNS	0.180	mg/L
ESTLDEN	7439-92-1	Lead	FB	0.003	mg/L
ESTLDEN	7439-92-1	Lead	RNS	0.004	mg/L
ESTLDEN	7439-96-5	Manganese	FB	0.003	mg/L
ESTLDEN	7439-96-5	Manganese	RNS	0.007	mg/L
ESTLDEN	7439-97-6	Mercury	FB	0.000	mg/L
ESTLDEN	7439-97-6	Mercury	RNS	0.000	mg/L
URS	91-20-3	Naphthalene	FB	1.400	ug/L
ESTLDEN	7782-49-2	Selenium	FB	0.004	mg/L
ESTLDEN	7440-24-6	Strontium	FB	0.001	mg/L
URS	108-88-3	Toluene	FB	1.000	ug/L

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Laboratory	CAS No.	Analyte	Sample QC Code	Detected Result	Unit
ESTLDEN	108-88-3	Toluene	TB	0.300	ug/L
ESTLDEN	79-01-6	Trichloroethene	TB	0.250	ug/L
URS	15117-96-1	Uranium-235	FB	0.165	pCi/g
URS	7440-61-1	Uranium-238	FB	2.190	pCi/g
ESTLDEN	7440-66-6	Zinc	FB	0.015	mg/L
ESTLDEN	7440-66-6	Zinc	RNS	0.016	mg/L

Field blank (EB = equipment, FB = field, RNS = rinse, TB = trip) results greater than detection limits (not "U" qualified).

Sample Matrix Spike Evaluation

The minimum and maximum MS results are summarized by chemical for the entire project in Table 12. High recoveries may indicate that the sample results are less than reported. Since this is environmentally conservative, it warrants no further action. For low recoveries, the associated maximum sample results were divided by the lowest percent recovery for each analyte. If the resulting number was less than the AL, decisions were not impacted, and no action was taken. For this project, all results were acceptable. The low recoveries for aluminum, copper, iron, lead and manganese were 0 percent. The WRW ALs for aluminum, copper, iron and manganese are at least three times greater than the highest sample result; thus, these low recoveries did not impact decisions. The 0 percent recovery for lead did not impact project decisions because the samples directly tied to the zero-percent recoveries were either remediated because they were greater than the WRW AL or their laboratory batch recovery was 100 percent. Therefore, indicating that the system was in control and the result was greater than reported.

Table 12
Sample MS Evaluation Summary

Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery	No. of Samples	No. of Lab Batches
SW-846 6010	7429-90-5	Aluminum	0	5960	8	8
SW-846 6010	7440-36-0	Antimony	33	98	8	8
SW-846 6010	7440-38-2	Arsenic	87	97	8	8
SW-846 6010	7440-39-3	Barium	88	122	8	8
SW-846 6010	7440-41-7	Beryllium	88	106	8	8
SW-846 6010	7440-43-9	Cadmium	87	97	8	8
SW-846 6010	7440-47-3	Chromium	79	146	8	8
SW-846 6010	7440-48-4	Cobalt	84	106	8	8
SW-846 6010	7440-50-8	Copper	0	1440	8	8
SW-846 6010	7439-89-6	Iron	0	6830	8	8
SW-846 6010	7439-92-1	Lead	0	2320	8	8
SW-846 6010	7439-93-2	Lithium	97	106	8	8
SW-846 6010	7439-96-5	Manganese	0	304	8	8
SW-846 6010	7439-97-6	Mercury	88	103	9	9
SW-846 6010	7439-98-7	Molybdenum	86	96	8	8
SW-846 6010	7440-02-0	Nickel	87	106	8	8

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Test Method	CAS No.	Analyte	Minimum Percent Recovery	Maximum Percent Recovery	No. of Samples	No. of Lab Batches
SW-846 6010	7782-49-2	Selenium	86	98	8	8
SW-846 6010	7440-22-4	Silver	89	104	8	8
SW-846 6010	7440-24-6	Strontium	90	103	8	8
SW-846 6010	7440-31-5	Tin	85	108	8	8
SW-846 6010	11-09-6	Uranium, Total	91	101	8	8
SW-846 6010	7440-62-2	Vanadium	79	134	8	8
SW-846 6010	7440-66-6	Zinc	77	369	8	8

13.2.2 Precision

Precision is measured by evaluating both MSDs and field duplicates, as described in the following sections.

Sample Matrix Spike Duplicate Evaluation

Laboratory precision is measured through use of MSDs, as summarized in Table 13. Analytes with the highest relative percent differences (RPDs) were reviewed by comparing the highest sample result to the WRW AL. For analytes with RPDs greater than 35 percent, if the highest sample concentrations were sufficiently below the AL, no further action is needed. For this project, the review indicated decisions were not impacted.

Table 13
Sample MSD Evaluation Summary

Test Method	CAS No.	Analyte	Max RPD (%)
SW-846 6010	7429-90-5	Aluminum	44.66
SW-846 6010	7440-36-0	Antimony	19.23
SW-846 6010	7440-38-2	Arsenic	6.52
SW-846 6010	7440-39-3	Barium	16.89
SW-846 6010	7440-41-7	Beryllium	12.05
SW-846 6010	7440-43-9	Cadmium	5.35
SW-846 6010	7440-47-3	Chromium	19.43
SW-846 6010	7440-48-4	Cobalt	6.45
SW-846 6010	7440-50-8	Copper	200.00
SW-846 6010	7439-89-6	Iron	200.00
SW-846 6010	7439-92-1	Lead	79.85
SW-846 6010	7439-93-2	Lithium	9.73
SW-846 6010	7439-96-5	Manganese	200.00
SW-846 6010	7439-97-6	Mercury	3.47
SW-846 6010	7439-98-7	Molybdenum	8.79
SW-846 6010	7440-02-0	Nickel	9.90
SW-846 6010	7782-49-2	Selenium	6.52
SW-846 6010	7440-22-4	Silver	6.97
SW-846 6010	7440-24-6	Strontium	9.84
SW-846 6010	7440-31-5	Tin	14.93
SW-846 6010	11-09-6	Uranium, Total	9.33
SW-846 6010	7440-62-2	Vanadium	30.84
SW-846 6010	7440-66-6	Zinc	70.83

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Field Duplicate Evaluation

Field duplicate results reflect sampling precision, or overall repeatability of the sampling process. The frequency of field duplicate collection should exceed 1 field duplicate per 20 real samples, or 5 percent. Table 14 indicates field duplicate frequencies were adequate for all analyses.

Table 14
Field Duplicate Sample Frequency Summary

Test Method	No. of Real Samples	No. of Duplicate Samples	% Duplicate Samples
SW-846 6010	48	10	21%
SW-846 6200	95	10	11%

The field duplicate RPD values indicate how much variation exists in the field duplicate analyses. EPA data validation guidelines state "there are no required review criteria for field duplicate analyses comparability" (EPA 1994b). For the DQA, the highest RPD values were reviewed (Table 15). For this project, project decisions were not impacted.

Table 15
RPD Evaluation Summary

Lab Code	Test Method	Analyte	Max RPD (%)
ESTLDEN	SW-846 6010	Aluminum	58.06
ESTLDEN	SW-846 6010	Arsenic	61.31
URS	SW-846 6200	Arsenic	23.57
URS	SW-846 6200	Barium	7.79
ESTLDEN	SW-846 6010	Barium	47.27
ESTLDEN	SW-846 6010	Beryllium	47.22
ESTLDEN	SW-846 6010	Chromium	53.33
ESTLDEN	SW-846 6010	Cobalt	25.00
URS	SW-846 6200	Cobalt	29.84
ESTLDEN	SW-846 6010	Copper	167.65
ESTLDEN	SW-846 6010	Iron	57.14
URS	SW-846 6200	Iron	26.89
URS	SW-846 6200	Lead	47.37
ESTLDEN	SW-846 6010	Lead	47.42
ESTLDEN	SW-846 6010	Lithium	58.06
ESTLDEN	SW-846 6010	Manganese	36.36
ESTLDEN	SW-846 6010	Mercury	24.24
ESTLDEN	SW-846 6010	Nickel	52.96
URS	SW-846 6200	Nickel	43.52
URS	SW-846 6200	Strontium	11.34
ESTLDEN	SW-846 6010	Strontium	33.33
ESTLDEN	SW-846 6010	Vanadium	60.47
ESTLDEN	SW-846 6010	Zinc	49.28

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13.2.3 Completeness

Based on original project DQOs, a minimum of 25 percent of ER Program analytical (and radiological) results must be formally verified and validated. Of that percentage, no more than 10 percent of the results may be rejected, which ensures that analytical laboratory practices are consistent with quality requirements. The number and percentage of validated records (codes without "1"), the number and percentage of verified records (codes with "1"), and the percentage of rejected records for each analyte group for this project are listed in Table 16. For this project, 2.10 percent of the analyses were validated. This is below Program requirements; however, the overall ER Program V&V goal of 25 percent is being met.

Results from method SW-846 6200 were used for evaluating all other detectable metals other than arsenic. ER RSOP Notification #05-05 documents this project decision (DOE 2005a).

Table 16
Validation and Verification Summary

Validation Qualifier Code	Total No. of Records	No. of SW-846 6010 Records	No. of SW-846 6200 Records
No V&V	714	391	323
J	6	2	4
J1	267	105	162
UJ	7	2	5
UJ1	203	24	179
V	48	19	29
V1	1664	561	1103
Total	2909	1104	1805
Validated	61	23	38
% Validated	2.10%	2.08%	2.11%
Verified	2134	690	1444
% Verified	73.36%	62.50%	80.00%

Validated codes: J, V, JB, UJ
Verified codes: 1, J1, V1, JB1, UJ1

13.2.4 Sensitivity

Reporting limits (RLs), in units of mg/kg, for metals were compared with RFCA WRW ALs. Adequate sensitivities of analytical methods were attained for all COCs that affect remediation decisions. "Adequate" sensitivity is defined as an RL less than an analyte's associated AL, typically less than one-half the AL.

13.3 Summary of Data Quality

Sample MSD RPDs greater than 35 percent indicate the sampling precision limits of some analytes have been exceeded without affecting project decisions. The validation percentage for all methods is below 25 percent; however, the ER Program V&V goal of 25 percent is being met. Data collected and used for IHSS Group NE-1, North Firing Range (PAC NW-1505) are adequate for decision making.

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14.0 CONCLUSIONS

Results of the accelerated action justify No Further Accelerated Action (NFAA) for IHSS Group NE-1, North Firing Range (PAC NW-1505). Justification is based on the following:

- The potential sources of contamination greater than WRW ALs that existed in the North Firing Range were removed. Residual metal concentrations, including arsenic, exist that are greater than background means plus two standard deviations.
- Residual contaminant concentrations for lead are below RFCA WRW ALs; and
- In accordance with the SSRS, subsurface soil in the area is not subject to significant erosion and all excavations were backfilled. Changes to sample locations and depths will occur when the area is regraded using the berm material. Subsurface samples could become surface soil samples, and vice versa.

15.0 REFERENCES

DOE, 1999, DOE Order 414.1A, Quality Assurance.

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, CO, June.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2004a, Correspondence to J. Legare, DOE RFO; from M. Aguilar, EPA, RE: No Further Accelerated Action Justification for Retention Pond C-1 (PAC Reference Number: SE-142.10), June 17, 2004.

DOE, 2004b, Industrial Area and Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004c, Industrial Area and Buffer Zone Sampling and Analysis Plan Addendum #IABZ-05-01, Rocky Flats Environmental Technology Site, Golden, CO, November.

DOE, 2005a, Environmental Restoration RFCA Standard Operating Protocol Notification #05-05, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2005b, Draft Data Summary Report, Pond A-1 (SE-142.1), Pond A-2 (SE-142.2), Pond A-3 (SE-142.3), Pond A-4 (SE-142.4), Pond A-5 (SE-142.12), Pond B-4 (SE-142.8), Pond B-5 (SE-142.9) and Pond C-2 (SE-142.11), Rocky Flats Environmental Technology Site, Golden, CO, June.

DOE, 2005c, Draft Closeout Report for IHSS Group NE-1 (Ponds B-1[IHSS NE-142.5], B-2[IHSS NE-142.6], and B-3[IHSS NE-142.7]), Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, CDPHE, and EPA, 2003, RFCA Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 1994a, Guidance for the Data Quality Objective Process, QA/G-4.

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EPA, 1994b, US EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, 540/R-94/012.

EPA, 1994c, US EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, 540/R-94/013.

EPA, 1998, Guidance for the Data Quality Assessment Process; Practical Methods for Data Analysis, QA/G-9.

EPA, 2005, Correspondence to J. Legare, DOE RFO; from M. Aguilar; EPA, RE: Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation; Notification #05-05; IHSS Group NE-1, North Firing Range, March 23, 2005.

K-H, 2002a, General Guidelines for Data Verification and Validation, DA-GR01-v1, October.

K-H, 2002b, V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v1, October.

K-H, 2002c, V&V Guidelines for Volatile Organics, DA-SS01-v1, October.

K-H, 2002d, V&V Guidelines for Semivolatile Organics, DA-SS02-v1, October.

K-H, 2002e, V&V Guidelines for Metals, DA-SS05-v1, October.

Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5.

Appendix A
Correspondence

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time: October 21, 2004 / 10:30 a.m.

Site Contact(s): K-H: Karen Wiemelt, Lee Norland, Annette Primrose, Mike Keating
K-H Team: Mike Anderson, and Gerry Kelly

Phone: 303-692-2035 – CDPHE
303/312-6312 - EPA
303/966-4226 – DOE

Agency: CDPHE: Harlen Ainscough, Dave Kruchek, Elizabeth Pottorff
EPA: Sam Garcia, Larry Kimmel
DOE: Norma Castañeda

Purpose of Contact: A meeting was held on October 21, 2004 to discuss the SE-1602, Accelerated Action; PAC NW-1505, IABZSAP Addendum 05-01; Trench T-7 Sampling, and NE-1, B Ponds RSOP Notification.

Discussion: See meeting minutes below.

Contact Record Prepared By: Gerry Kelly

I. Attendees:

CDPHE: Harlen Ainscough, Dave Kruchek, Elizabeth Pottorff
EPA: Sam Garcia, Larry Kimmel
DOE: Norma Castañeda
K-H: Karen Wiemelt, Lee Norland, Annette Primrose, Mike Keating,
K-H: Team: Mike Anderson, and Gerry Kelly

II. Report Status

The following reports were handed out.
IABZSAP Addendum 05-01, PAC NW-1505
ER RSOP Notification 05-01, IHSS NE-1, B Ponds

III. Issues

No Sitewide issues were discussed.

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IV. Specific Comments

East Firing Range, SE-1602 - Accelerated Action

Data showing a correlation between lead and arsenic soil concentrations at the firing range were presented. In summary, there is a good correlation when the arsenic concentrations are greater than 35 mg/kg and the lead concentrations are greater than 100 mg/kg. The following resolutions were agreed upon.

1. Based on this correlation, DOE will develop a remediation plan.
2. Soil will be removed where arsenic concentrations are greater than 35 mg/kg and lead concentrations are greater than 1000 mg/kg.
3. Soil remediation will cease when arsenic concentrations are less than 35 mg/kg. The regulatory contact record will discuss this cleanup level, and will mention that residual arsenic concentrations will be evaluated in the Comprehensive Risk Assessment and the Remedial Investigation/Feasibility Study. Method 6200 (XRF) will be used to determine the extent of cleanup. Method 6010 (off-site analysis) will be used for confirmation samples.
4. The 'coffin" area will be remediated as appropriate.
5. A decision to remediate soil in the southern area will not be made until USFWS evaluates potential impacts on the Preble's meadow jumping mouse (PMJM).
6. DOE will evaluate whether the range had ever been refaced over its 30 year history.

North Firing Range, PAC NW-1505, IABZSAP Addendum 05-01

CDPHE comments on the SAP Addendum were discussed. The following resolutions were agreed to:

1. Because the soil from the south face of the north berm was excavated and placed on the north face of the berm, samples from the north face will be collected from the A and B intervals. Because surface soil was removed from a portion of the south face, samples from the south face will be collected from the A interval only.
2. Because some potentially lead-contaminated soil may have been used to level the floor area of the shooting structure, statistical samples will be collected from the northern third of the floor area. The existing statistical sampling grid will be extended to the south to cover the northern third of the floor area.
3. The text will be expanded to explain that the proposed sampling locations include the area receiving run-off from the collection bucket area.
4. The contours on the proposed sampling location map will be made more visible (showing the berms), and the location of the shooting structure will be shown. To more accurately show the shooting structure, K-H will obtain field coordinates for the corners of the structure.
5. The text will be expanded to state that the drain line and any sediment within the line will be removed and that the line and sediment will be characterized for waste management purposes.
6. The text will be expanded to state that bullets and fragments encountered will be qualitatively described, including estimated volume.
7. The text will be expanded to clarify that the North Firing Range is not an IHSS.
8. In Section 3.0, the text will be expanded to explain that sampling will occur after the slab has been removed.
9. The buildings on Figure 2 will be labeled.

10. In Section 3.0 (page 4, 3rd paragraph), the text will be edited to make it clear that samples will be collected from inside and outside the berm.
11. DOE will evaluate the historical placement of automobiles in the area, the related direction of fire (target practice), and the need for additional sampling.

Trench T-7 - Sampling

A draft regulatory contact record and sampling location map for sampling the A and B intervals at 3 locations in Trench T-7 was handed out. The agencies concurred, and a final regulatory contact record will be prepared.

NE-1, B-Ponds ER RSOP Notification

DOE will submit the ER Notification for the B-Ponds to the regulatory agencies prior to the October 27 regulatory agency meeting. This notification will be on the meeting agenda.

DOE will submit maps showing existing sediment data for the A and B Ponds and Pond C-2 prior to the October 27 regulatory agency meeting. Maps will be submitted only if the data quality has been evaluated.

IHSS Groups 300-2 and 400-5 Data Summary Reports

Data summary reports for these IHSS groups will be submitted to the regulatory agencies before the next meeting (see below). These reports will be on the agenda.

V. Next Meeting

The next meeting is scheduled for November 4, 2004

Required Distribution:

M. Aguilar, USEPA
S. Bell, DOE-RFFO
J. Berardini, K-H
B. Birk, DOE-RFFO
L. Brooks, K-H ESS
M. Broussard, K-H RISS
L. Butler, K-H RISS
G. Carnival, K-H RISS
N. Castaneda, DOE-RFFO
C. Deck, K-H Legal
S. Gunderson, CDPHE
M. Keating, K-H RISS
G. Kleeman, USEPA
D. Kruchek, CDPHE
D. Mayo, K-H RISS
R. McCallister, DOE-RFFO
J. Mead, K-H ESS
S. Nesta, K-H RISS
L. Norland, K-H RISS
K. North, K-H ESS
E. Pottorff, CDPHE
A. Primrose, K-H RISS
R. Schassburger, DOE-RFFO
S. Serreze, K-H RISS
D. Shelton, K-H ESS
C. Spreng, CDPHE
S. Surovchak, DOE-RFFO
K. Wiemelt, K-H RISS
C. Zahm, K-H Legal

Additional Distribution:

_____
_____
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_____
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_____
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_____
_____

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time:	October 26, 2004, 10:00 am		
Site Contact(s,:	Norma Castaneda	Annette Primrose	
Phone:	303 966-4226	303 966-4385	
Regulatory Contact:	Larry Kimmel	Harlen Ainscough	David Kruchek
Phone:	303 312-6659	303 692-3337	303 692 3328
Agency:	EPA	CDPHE	CDPHE

Purpose of Contact: Sample Point Relocation for the North Firing Range

Discussion

The line of sample points that are biased for the base of the south face of the north berm are located approximately 33 feet south of the berm. These sample points will be moved so that these are located at the base of the south face of the north berm, adjacent to the slab. A separate contact record will be generated for the additional sample relocations that may be required based on these changes.

Because of the impending slab removal, sample collection will proceed immediately. The full 6" depth sample will be collected at these locations.

Contact Record Prepared by: Annette Primrose

Required Distribution:

M. Aguilar, USEPA
H. Ainscough, CDPHE
S. Bell, DOE-RFPO
J. Berardini, K-H
B. Birk, DOE-RFPO
L. Brooks, K-H ESS
L. Butler, K-H RISS
G. Carnival, K-H RISS
N. Castaneda, DOE-RFPO
C. Deck, K-H Legal
N. Demos, SSOC
S. Gunderson, CDPHE
M. Keating, K-H RISS
G. Kleeman, USEPA
D. Kruchek, CDPHE
J. Legare, DOE-RFPO
D. Mayo, K-H RISS
J. Mead, K-H ESS
S. Nesta, K-H RISS
L. Norland, K-H RISS
K. North, K-H ESS
E. Pottorff, CDPHE
A. Primrose, K-H RISS
R. Schassburger, DOE-RFPO
S. Serreze, K-H RISS
D. Shelton, K-H ESS
C. Spreng, CDPHE
S. Surovchak, DOE-RFPO
J. Walstrom, K-H RISS
K. Wiemelt, K-H RISS
C. Zahm, K-H Legal

Additional Distribution:

Larry Kimmel, USEPA
Bob Koehler, K-H RISS
Sherry Lopez, K-H RISS
Tom Hanson, URS
Nan Elzinga, URS
Scott Maxey, URS
Gerry Kelly, K-H RISS

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time:	November 10, 2004 / 1:00		
Site Contact(s,:	Norma Castaneda	Annette Primrose	Bob Davis
Phone:	303 966-4226	303 966-4385	303 966-7026
Regulatory Contact:	Larry Kimmel	Harlen Ainscough	David Kruchek
Phone:	303 312-6659	303 692-3337	303 692 3328
Agency:	EPA	CDPHE	CDPHE

Purpose of Contact: Use of North Firing Range Soils for the Present Landfill Cover

Discussion

At Site closure, the North Firing Range berms will be removed. However, enough soil will be kept to bring this area up to final grade as indicated by the Final Land Configuration. Excess soil will be used as backfill elsewhere on Site. Soils from the east and west berms that are outside the investigation area will be used immediately and will be placed under the Subtitle C Cap.

As agreed to at the ER status meeting on Wednesday, November 10, 2004, soil from the investigation area, primarily the North Firing Range north berm, will be used after characterization. Based on the results, these will be remediated as appropriate with the remainder used for the construction of the Present Landfill Cover.

If soils below Wildlife Refuge Worker can be identified in time, then these will also be placed under the Subtitle C Cap. Otherwise, these soils will be used as backfill and placed where they will be below the final surface. The provisions in the ER RSOP and the CRA, including the ecological risk screen, will be followed to determine where this material can be used for backfill.

Contact Record Prepared by: Annette Primrose

Required Distribution:

M. Aguilar, USEPA
H. Ainscough, CDPHE
S. Bell, DOE-RFPO
J. Berardini, K-H
B. Birk, DOE-RFPO
L. Brooks, K-H ESS
L. Butler, K-H RISS
G. Carnival, K-H RISS
N. Castaneda, DOE-RFPO
C. Deck, K-H Legal
N. Demos, SSOC
S. Gunderson, CDPHE
M. Keating, K-H RISS
L. Kimmel, USEPA
D. Kruchek, CDPHE
J. Legare, DOE-RFPO
D. Mayo, K-H RISS
J. Mead, K-H ESS
S. Nesta, K-H RISS
L. Norland, K-H RISS
K. North, K-H ESS
E. Pottorff, CDPHE
A. Primrose, K-H RISS
R. Schassburger, DOE-RFPO
S. Serreze, K-H RISS
D. Shelton, K-H ESS
C. Spreng, CDPHE
S. Surovchak, DOE-RFPO
J. Walstrom, K-H RISS
K. Wiemelt, K-H RISS
C. Zahm, K-H Legal

Additional Distribution:

B. Davis, K-H RISS
B. Koehler, K-H RISS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time:	November 10, 2004, 9:00 am		
Site Contact(s,:	Norma Castaneda	Annette Primrose	
Phone:	303 966-4226	303 966-4385	
Regulatory Contact:	Larry Kimmel	Harlen Ainscough	David Kruchek
Phone:	303 312-6659	303 692-3337	303 692 3328
Agency:	EPA	CDPHE	CDPHE

Purpose of Contact: Sample Location changes for the North Firing Range SAP

Discussion

Additional, biased sample locations will be placed along the northern edge of the north berm at approximately 40 feet spacing, corresponding to the grid spacing used at this location. Locations will be placed approximately 3 feet up from the base of the berm. A and B intervals will be collected at these locations.

Sample locations BV53-012, BV53-013, BV53-014 and BV53-015 are located about 4 feet south of the biased samples at the base of the south face of the northern berm. These samples will be converted to biased sample locations and moved onto the south face of the northern berm, about 4 feet above the base of the berm. As previously agreed, only A intervals will be collected at these locations because soil was removed from this face prior to building the shoot house.

The slab and/or contours are inaccurate as shown on the map in the current SAP. Samples will be collected as per the intent of this contact record, not as depicted on the current map. The contours and/or locations will be corrected for any future documents.

Contact Record Prepared by: Annette Primrose

Required Distribution:

M. Aguilar, USEPA
H. Ainscough, CDPHE
S. Bell, DOE-RFPO
J. Berardini, K-H
B. Birk, DOE-RFPO
L. Brooks, K-H ESS
L. Butler, K-H RISS
G. Carnival, K-H RISS
N. Castaneda, DOE-RFPO
C. Deck, K-H Legal
N. Demos, SSOC
S. Gunderson, CDPHE
M. Keating, K-H RISS
G. Kleeman, USEPA
D. Kruchek, CDPHE
J. Legare, DOE-RFPO
D. Mayo, K-H RISS
J. Mead, K-H ESS
S. Nesta, K-H RISS
L. Norland, K-H RISS
K. North, K-H ESS
E. Pottorff, CDPHE
A. Primrose, K-H RISS
R. Schassburger, DOE-RFPO
S. Serreze, K-H RISS
D. Shelton, K-H ESS
C. Spreng, CDPHE
S. Surovchak, DOE-RFPO
J. Walstrom, K-H RISS
K. Wiemelt, K-H RISS
C. Zahm, K-H Legal

Additional Distribution:

Larry Kimmel, USEPA
Bob Koehler, K-H RISS
Sherry Lopez, K-H RISS
Tom Hanson, URS
Nan Elzinga, URS
Scott Maxey, URS

Ruthven, Mark

From: Primrose, Annette
Sent: Wednesday, March 30, 2005 5:41 AM
To: Castaneda, Norma; Elizabeth Pottorff; 'Dirk Applegate'; Elzinga, Nanette; Flannery, Mike; Garcia, Sam; Gregory-Frost, Laurie; Hanson, Thomas S.; Horne, Alan; Larry Kimmel; Ainscough, Harlen; Knapp, Shaun; Maxey, Scott; Mayo, Donna; Nesta, Stephen; Paschall, James R.; Rosco, Douglas; Serreze, Susan; Waldroop, Michael; Walstrom, Jan; Wiemelt, Karen; Geimer, Raymond; Molter, Robert J. (Joe); Kneiser, Jan; Koehler, Bob; Pudlik, Gregory P.
Subject: North Firing Range Status for 3-29-05

- Three lead exceedances at the North Firing Range were remediated yesterday. Excavation depth was 1 foot or more at each location.
- 3 DRT bags were filled with excavated material.
- Samples were collected from the sidewalls and bottom of each excavation.
- Workers and equipment returned to the Oil Burn Pit. Additional work at this project site is on hold until results are received.

NFR drt bag loading.jpg

Annette Primrose
x 4385 cell (303) 994-2761

68/

Ruthven, Mark

From: Primrose, Annette
Sent: Friday, April 01, 2005 6:26 PM
To: Castaneda, Norma; Elizabeth Pottorff; 'Dirk Applegate'; Elzinga, Nanette; Flannery, Mike; Garcia, Sam; Gregory-Frost, Laurie; Hanson, Thomas S.; Horne, Alan; Larry Kimmel; Ainscough, Harlen; Knapp, Shaun; Maxey, Scott; Mayo, Donna; Nesta, Stephen; Paschall, James R.; Rosco, Douglas; Serreze, Susan; Waldroop, Michael; Walstrom, Jan; Wiemelt, Karen; Geimer, Raymond; Molter, Robert J. (Joe); Kneiser, Jan; Koehler, Bob; Pudlik, Gregory P.
Subject: North Firing Range Status for 4-1-05

Offsite sample results were received and 12 of the 15 confirmation samples were below action levels. Two of the three samples above action levels were at the westernmost excavation. The other sample represented the bottom of the excavation at the western side of the culvert. Additional excavation is planned for Monday along with culvert removal.

Annette Primrose
x 4385 cell (303) 994-2761

69/

Ruthven, Mark

From: Primrose, Annette
Sent: Monday, April 04, 2005 6:49 PM
To: Castaneda, Norma; Elizabeth Pottorff; 'Dirk Applegate'; Elzinga, Nanette; Flannery, Mike; Garcia, Sam; Gregory-Frost, Laurie; Hanson, Thomas S.; Horne, Alan; Larry Kimmel; Ainscough, Harlen; Knapp, Shaun; Maxey, Scott; Mayo, Donna; Nesta, Stephen; Paschall, James R.; Rosco, Douglas; Serreze, Susan; Waldroop, Michael; Walstrom, Jan; Wiemelt, Karen; Geimer, Raymond; Molter, Robert J. (Joe); Kneiser, Jan; Koehler, Bob; Pudlik, Gregory P.
Subject: North Firing Range Status for 4-4-05

- Additional soil was removed from the northern and southern sides of the western hotspot, and from the bottom of the hotspot west of the culvert.
- Confirmation samples were collected from the newly excavated sides.
- The berm was removed above the culvert, with the removed soil placed inside the berms forming the firing range.
- The culvert and associated soil within was removed.
- Confirmation samples were collected along the length of the former culvert. EPA splits were collected from these locations.
- The project site was secured.

NFR culvert removed.jpg

Annette Primrose
x 4385 cell (303) 994-2761

70/

Ruthven, Mark

From: Primrose, Annette
Sent: Wednesday, April 06, 2005 6:31 AM
To: Castaneda, Norma; Elizabeth Pottorff; 'Dirk Applegate'; Elzinga, Nanette; Flannery, Mike; Garcia, Sam; Gregory-Frost, Laurie; Hanson, Thomas S.; Horne, Alan; Larry Kimmel; Ainscough, Harlen; Knapp, Shaun; Maxey, Scott; Mayo, Donna; Nesta, Stephen; Paschall, James R.; Rosco, Douglas; Serreze, Susan; Waldroop, Michael; Walstrom, Jan; Wiemelt, Karen; Geimer, Raymond; Molter, Robert J. (Joe); Kneiser, Jan; Koehler, Bob; Pudlik, Gregory P.
Subject: North Firing Range Status for 4-5-05

- Confirmation sample results from the additional hotspot excavations were received. Sample results from the north wall of the western hotspot and the bottom of the hotspot west of the culvert were well below action levels based on onsite analyses.
- The south wall of the western hotspot results were above action levels based on onsite analysis. Additional excavation is planned at this location.
- Onsite samples results along the length of the former culvert are anticipated today.

Annette Primrose
x 4385 cell (303) 994-2761

71/

Ruthven, Mark

From: Primrose, Annette
Sent: Thursday, April 07, 2005 5:14 AM
To: Castaneda, Norma; Elizabeth Pottorff; 'Dirk Applegate'; Elzinga, Nanette; Flannery, Mike; Garcia, Sam; Gregory-Frost, Laurie; Hanson, Thomas S.; Horne, Alan; Larry Kimmel; Ainscough, Harlen; Knapp, Shaun; Maxey, Scott; Mayo, Donna; Nesta, Stephen; Paschall, James R.; Rosco, Douglas; Serreze, Susan; Waldroop, Michael; Walstrom, Jan; Wiemelt, Karen; Geimer, Raymond; Molter, Robert J. (Joe); Kneiser, Jan; Koehler, Bob; Pudlik, Gregory P.
Subject: North Firing Range Status for 4-6-05

- Based on onsite lab results, additional soil was removed from the south side of the western hotspot. All other onsite sample results were below action levels.
- Material was packaged into waste containers.

Annette Primrose
x 4385 cell (303) 994-2761

72/

Ruthven, Mark

From: Primrose, Annette
Sent: Friday, April 08, 2005 5:54 AM
To: Primrose, Annette; Castaneda, Norma; Elizabeth Pottorff; 'Dirk Applegate'; Elzinga, Nanette; Flannery, Mike; Garcia, Sam; Gregory-Frost, Laurie; Hanson, Thomas S.; Horne, Alan; Larry Kimmel; Ainscough, Harlen; Knapp, Shaun; Maxey, Scott; Mayo, Donna; Nesta, Stephen; Paschall, James R.; Rosco, Douglas; Serreze, Susan; Waldroop, Michael; Walstrom, Jan; Wiemelt, Karen; Geimer, Raymond; Molter, Robert J. (Joe); Kneiser, Jan; Koehler, Bob; Pudlik, Gregory P.
Subject: North Firing Range Status for 4-705

Based on onsite lab results, additional soil was removed from the south side of the western hotspot.

Annette Primrose
x 4385 cell (303) 994-2761

73/

Ruthven, Mark

From: Primrose, Annette
Sent: Monday, April 11, 2005 5:43 AM
To: Castaneda, Norma; Elizabeth Pottorff; 'Dirk Applegate'; Elzinga, Nanette; Flannery, Mike; Garcia, Sam; Gregory-Frost, Laurie; Hanson, Thomas S.; Horne, Alan; Larry Kimmel; Ainscough, Harlen; Knapp, Shaun; Maxey, Scott; Mayo, Donna; Nesta, Stephen; Paschall, James R.; Rosco, Douglas; Serreze, Susan; Waldroop, Michael; Walstrom, Jan; Wiemelt, Karen; Geimer, Raymond; Molter, Robert J. (Joe); Kneiser, Jan; Koehler, Bob; Pudlik, Gregory P.
Subject: North Firing Range Status for 4-8-05

- Onsite lab results show that the soil on the south side of the western hotspot is below action levels.
- Remediation is complete.

Annette Primrose
x 4385 cell (303) 994-2761

74/

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time:	April 12, 2005, 0800	
Site Contact(s):	Annette Primrose	Norma Castaneda
Phone:	966-4385	966-4226
Regulatory Contact:	Larry Kimmel	Harlen Ainscough
Phone:	303 312-6659	303 692-3337
Agency:	USEPA	CDPHE

Purpose of Contact: Backfill at North Firing Range

Discussion

The three areas of elevated lead were remediated at the North Firing Range as indicated by onsite XRF sample results that are all below action levels. Based on this information, backfill was performed, primarily during culvert removal. While offsite results are not yet received, these are expected to be lower. If offsite confirmation sample results are above action levels, additional remediation is anticipated.

Contact Record Prepared By: Annette Primrose

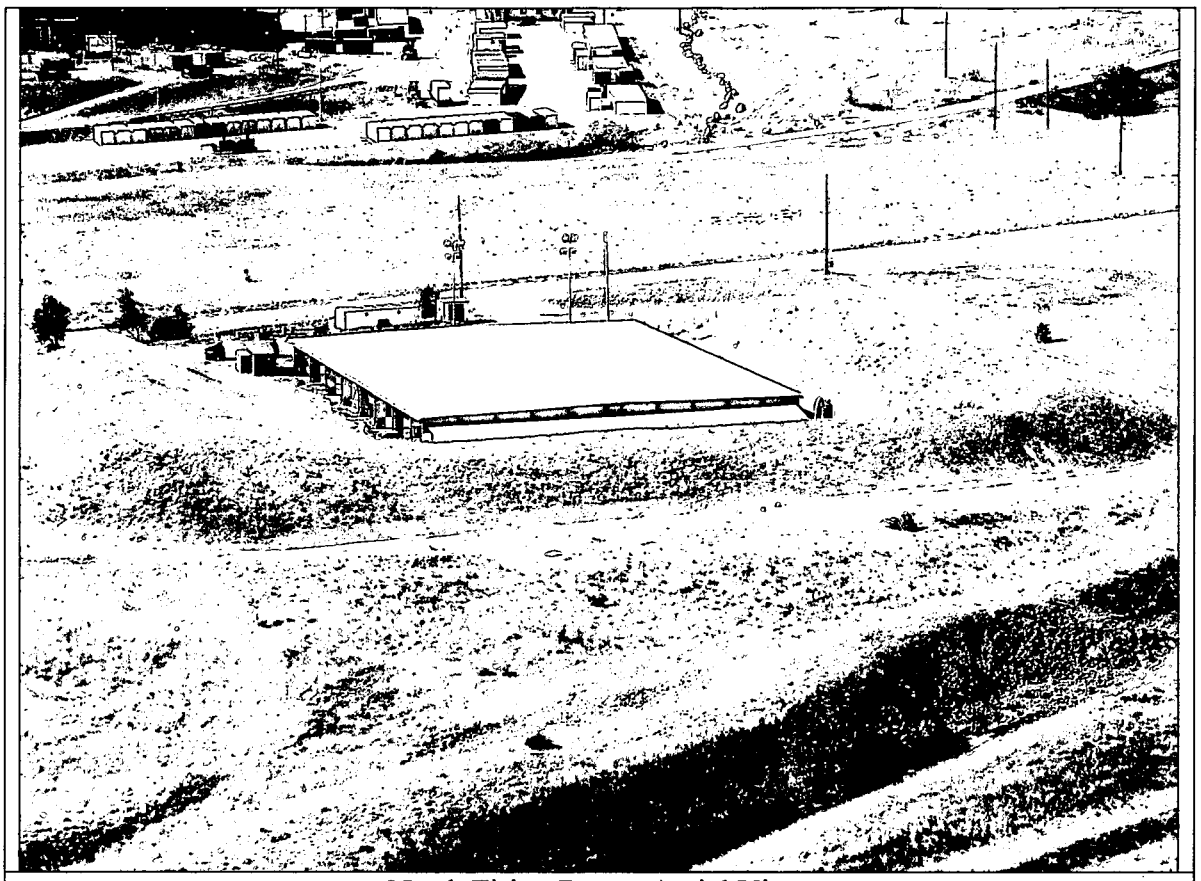
Required Distribution:

M. Aguilar, USEPA
H. Ainscough, CDPHE
J. Berardini, K-H
B. Birk, DOE-RFPO
L. Brooks, K-H ESS
G. Carnival, K-H RISS
N. Castaneda, DOE-RFPO
C. Deck, K-H Legal
N. Demos, SSOC
S. Garcia, USEPA
S. Gunderson, CDPHE
S. Johnson, K-H ESS
M. Keating, K-H RISS
L. Kimmel, USEPA
D. Kruchek, CDPHE
J. Legare, DOE-RFPO
D. Mayo, K-H RISS
S. Nesta, K-H RISS
L. Norland, K-H RISS
E. Pottorff, CDPHE
A. Primrose, K-H RISS
M. Roy, DOE-RFPO
R. Schassburger, DOE-RFPO
S. Serreze, K-H RISS
D. Shelton, K-H ESS
C. Spreng, CDPHE
S. Surovchak, DOE-RFPO
J. Walstrom, K-H RISS
K. Wiemelt, K-H RISS
C. Zahm, K-H Legal

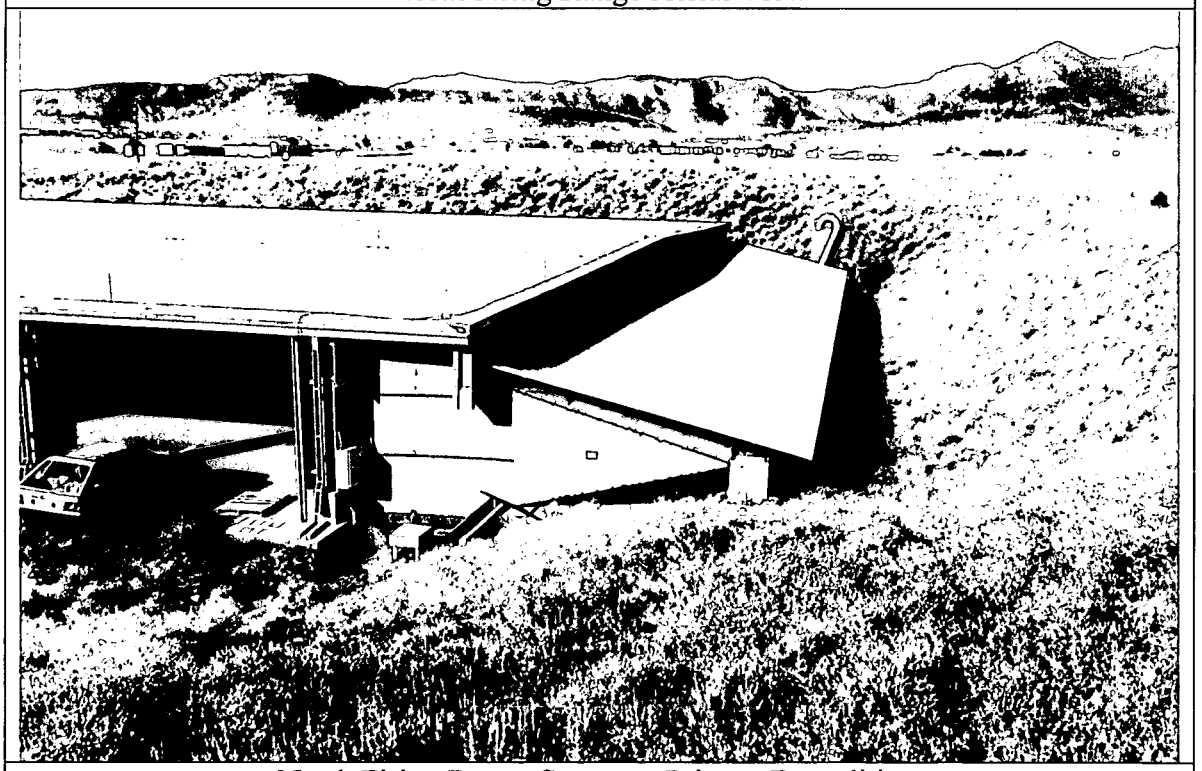
Additional Distribution:

Bob Koehler, K-H RISS

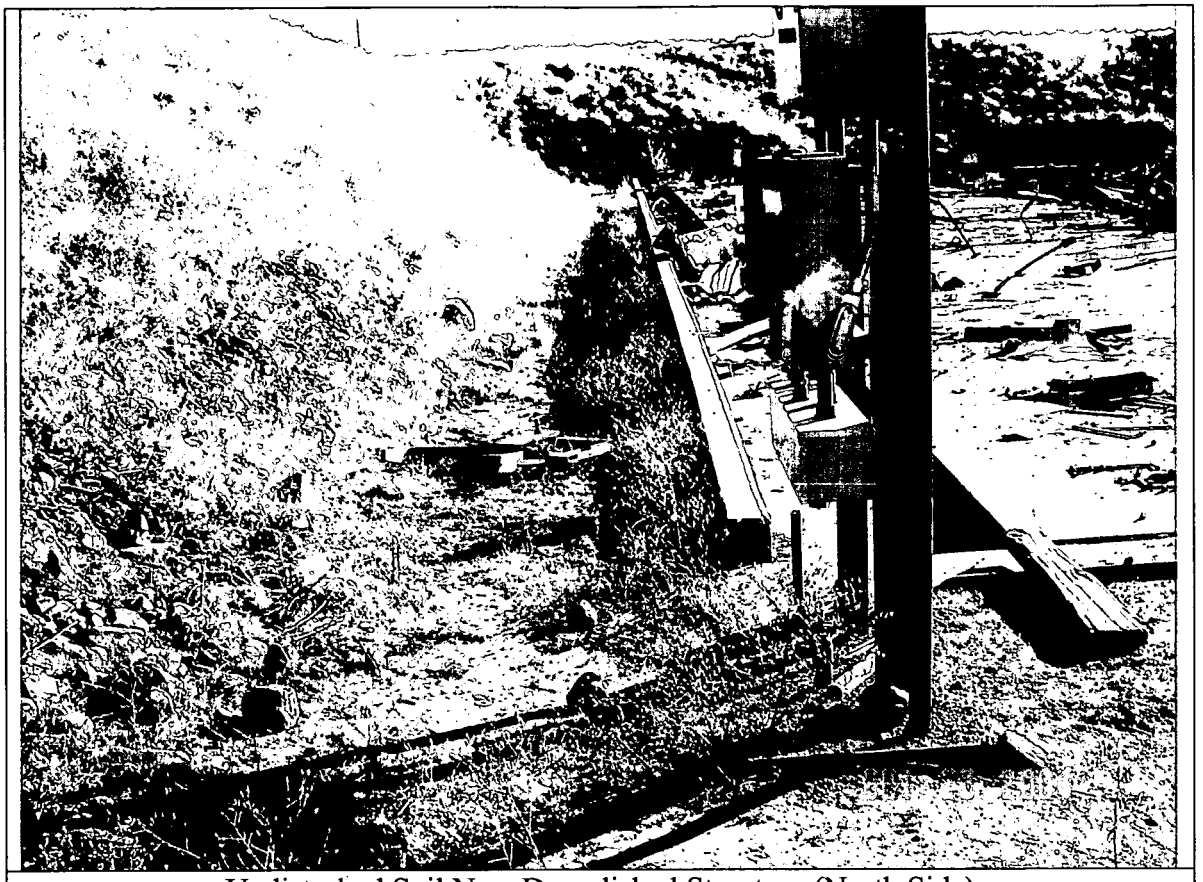
Appendix B
Project Photographs



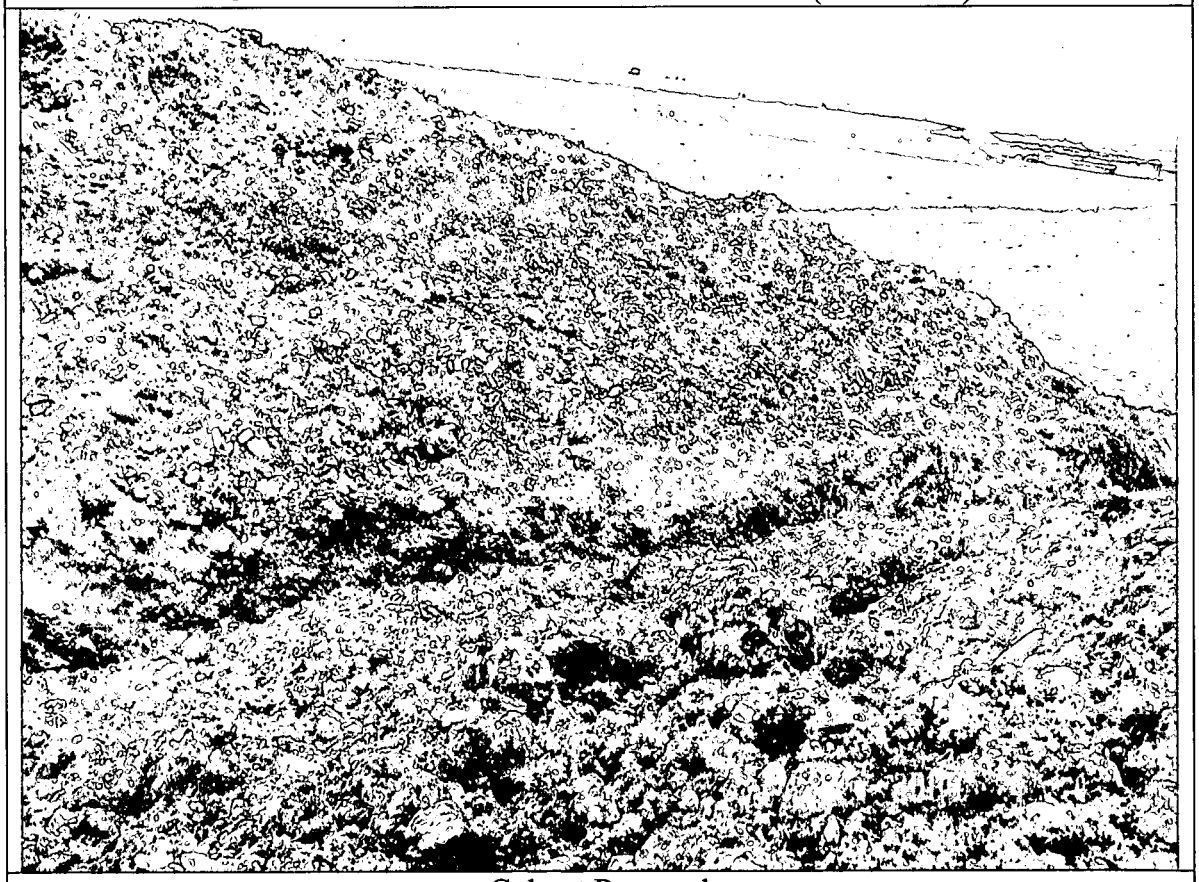
North Firing Range Aerial View



North Firing Range Structure Prior to Demolition



Undisturbed Soil Near Demolished Structure (North Side)



Culvert Removal

Loading of DRT Bags

Enclosure

CD Containing Standardized Real and QC Accelerated Action Data

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW53-016	Copper	250.000	40900.000	38.210	mg/kg	0.0	1.0	SW-846 6010
BW53-016	Lead	440.000	1000.000	24.970	mg/kg	0.0	1.0	SW-846 6010
BW53-016	Zinc	850.000	307000.000	139.100	mg/kg	0.0	1.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW53-015	Lead	66.000	1000.000	24.970	mg/kg	0.0	3.0	SW-846 6010
BW53-015	Zinc	170.000	307000.000	139.100	mg/kg	0.0	3.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW53-020	Lead	90.000	1000.000	24.970	mg/kg	9.0	9.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW53-019	Copper	93.000	40900.000	38.210	mg/kg	21.5	21.8	SW-846 6010
BW53-019	Lead	160.000	1000.000	24.970	mg/kg	21.5	21.8	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW53-018	Zinc	420.000	307000.000	139.100	mg/kg	9.0	9.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW53-010	Antimony	1.600	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BW53-010	Copper	41.000	40900.000	18.060	mg/kg	0.0	0.3	SW-846 6010
BW53-010	Lead	200.000	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-016	Antimony	18.700	409.000	0.470	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Arsenic	52.000	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Barium	732.000	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Chromium	43.800	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Iron	37100.000	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Lead	697.000	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Nickel	49.200	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Strontium	176.000	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Tin	12.200	613000.000	2.900	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Zinc	83.000	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-059	Copper	280.000	40900.000	38.210	mg/kg	0.0	2.0	SW-846 6010
BV53-059	Lead	800.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010
BV53-059	Zinc	410.000	307000.000	139.100	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-068	Lead	85.000	1000.000	24.970	mg/kg	3.0	3.2	SW-846 6010
BV53-068	Zinc	1400.000	307000.000	139.100	mg/kg	4.0	4.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-056	Lead	180.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-057	Copper	1000.000	40900.000	38.210	mg/kg	0.0	2.0	SW-846 6010
BV53-057	Lead	990.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010
BV53-057	Zinc	140.000	307000.000	139.100	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-037	Barium	979.000	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-037	Chromium	35.900	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-037	Iron	36100.000	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-037	Nickel	49.100	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-037	Selenium	20.900	5110.000	1.224	mg/kg	0.0	0.5	SW-846 6200
BV53-037	Vanadium	92.900	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-037	Zinc	100.000	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-058	Lead	670.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-066	Copper	41.000	40900.000	38.210	mg/kg	1.0	1.3	SW-846 6010
BV53-066	Lead	250.000	1000.000	24.970	mg/kg	1.0	1.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-063	Copper	75.000	40900.000	38.210	mg/kg	0.0	2.0	SW-846 6010
BV53-063	Lead	480.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-065	Copper	320.000	40900.000	38.210	mg/kg	2.0	2.3	SW-846 6010
BV53-065	Lead	310.000	1000.000	24.970	mg/kg	2.0	2.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-064	Copper	87.000	40900.000	38.210	mg/kg	0.0	2.0	SW-846 6010
BV53-064	Lead	970.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-035	Arsenic	53.500	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Barium	743.000	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Chromium	35.900	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Iron	38100.000	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Lead	190.000	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Nickel	48.400	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Strontium	180.000	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Tin	10.900	613000.000	2.900	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Vanadium	101.000	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Zinc	75.700	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-047	Antimony	1.500	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BV53-047	Copper	20.000	40900.000	18.060	mg/kg	0.0	0.3	SW-846 6010
BV53-047	Lead	650.000	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-032	Arsenic	70.600	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Barium	767.000	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Chromium	46.300	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Iron	37800.000	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Lead	562.000	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Nickel	47.100	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Selenium	2.660	5110.000	1.224	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Strontium	168.000	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Vanadium	88.200	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-070	Copper	43.000	40900.000	38.210	mg/kg	0.0	2.0	SW-846 6010
BV53-070	Lead	630.000	1000.000	24.970	mg/kg	0.0	2.0	SW-846 6010

Location	Analyte	Result	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-033	Arsenic	33.200	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-033	Barium	545.000	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-033	Chromium	71.300	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-033	Iron	19200.000	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-033	Lead	143.000	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-033	Nickel	22.900	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-033	Strontium	142.000	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200

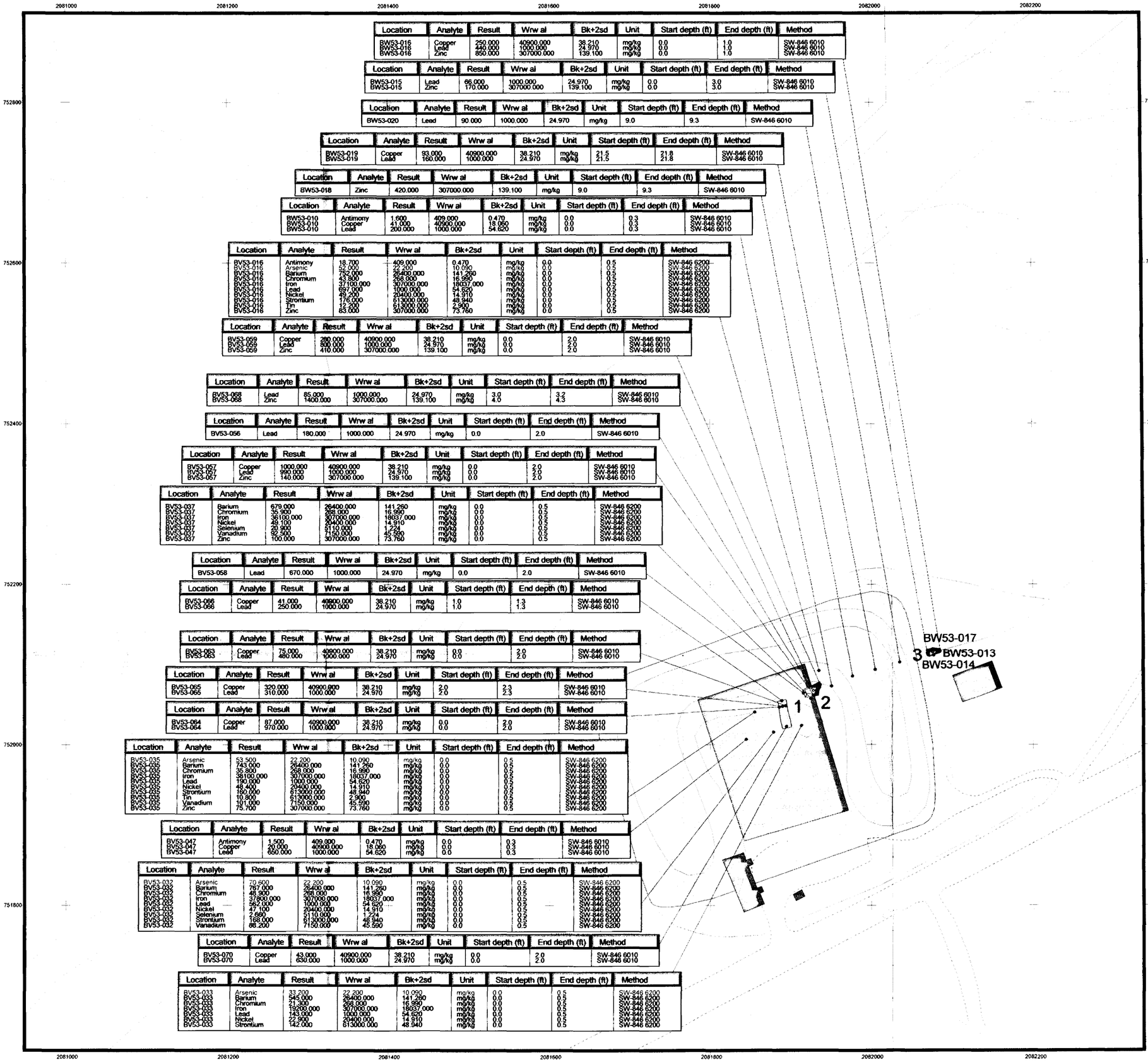


Figure 6
IHSS Group NE-1, North Firing Range (PAC NW-1505) Residual Concentrations Greater than Background Mean Plus Two Standard Deviations and Bounding the Excavation Areas

KEY

- Sampling location with results less than background means plus two standard deviations
- Sampling location with result greater than background means plus two standard deviations
- Sampling location with result greater than wildlife refuge worker action level
  Green font = result will not be remediated (see document text)

1 Excavation boundary reference

Excavation Boundary

PAC NW-1505

Structure removed at PAC NW-1505

Dirt road

Stream

Pond

Topographic contour 5 ft

N
W E
S

100 0 100 Feet

Scale 1: 1100

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Date: 4.27.05

RADMS

Prepared for:

KAISER•HILL COMPANY

File: W:\Projects\FY2005\NE-1_North_Firing_Range\nfr_cor_041305.apr

BZ-A-000861

FIGURE 4

IHSS Group NE-1
PAC NW-1505
North Firing Range
Analytical Results
Greater Than Background Means Plus Two Standard Deviations (Inner)

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-022	Arsenic	37.100	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-022	Barium	775.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-022	Chromium	36.900	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-022	Cobalt	11.700	NA	1550.000	10.910	mg/kg	0.0	0.5	SW-846 6200
BV53-022	Iron	34000.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-022	Nickel	44.500	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-022	Strontium	179.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-022	Vanadium	84.700	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-023	Arsenic	43.100	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-023	Barium	683.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-023	Chromium	35.500	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-023	Cobalt	12.500	NA	1550.000	10.910	mg/kg	0.0	0.5	SW-846 6200
BV53-023	Iron	37500.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-023	Nickel	49.700	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-023	Strontium	159.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-023	Vanadium	105.000	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-023	Zinc	78.900	NA	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-014	Antimony	13.300	NA	409.000	0.470	mg/kg	0.0	0.5	SW-846 6200
BV53-014	Arsenic	67.300	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-014	Barium	724.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-014	Chromium	46.600	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-014	Iron	35000.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-014	Lead	608.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-014	Nickel	44.900	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-014	Selenium	2.460	NA	5110.000	1.224	mg/kg	0.0	0.5	SW-846 6200
BV53-014	Strontium	159.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-014	Vanadium	89.500	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-013	Arsenic	52.800	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-013	Barium	829.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-013	Chromium	47.900	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-013	Iron	34900.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-013	Lead	342.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-013	Nickel	42.800	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-013	Strontium	162.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-013	Vanadium	89.200	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-024	Arsenic	35.600	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-024	Barium	722.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-024	Chromium	49.700	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-024	Cobalt	12.200	NA	1550.000	10.910	mg/kg	0.0	0.5	SW-846 6200
BV53-024	Iron	38500.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-024	Nickel	53.800	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-024	Strontium	163.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-024	Vanadium	91.600	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-050	Antimony	2.600	NA	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BV53-050	Copper	65.000	NA	40900.000	18.060	mg/kg	0.0	0.3	SW-846 6010
BV53-050	Lead	440.000	NA	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010
BV53-050	Mercury	0.340	NA	25200.000	0.134	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-025	Arsenic	39.000	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-025	Barium	724.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-025	Chromium	48.200	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-025	Cobalt	11.100	NA	1550.000	10.910	mg/kg	0.0	0.5	SW-846 6200
BV53-025	Iron	36500.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-025	Lead	139.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-025	Nickel	48.100	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-025	Strontium	172.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-025	Vanadium	74.500	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-025	Zinc	81.300	NA	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-049	Antimony	1.200	NA	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BV53-049	Lead	110.000	NA	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010
BV53-049	Tin	22.000	NA	613000.000	2.900	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-015	Antimony	13.500	NA	409.000	0.470	mg/kg	0.0	0.5	SW-846 6200
BV53-015	Arsenic	56.400	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-015	Barium	804.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-015	Chromium	34.600	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-015	Iron	34000.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-015	Lead	375.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-015	Nickel	40.900	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-015	Strontium	170.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-015	Vanadium	69.400	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-015	Zinc	74.200	NA	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-019	Arsenic	38.300	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-019	Barium	767.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-019	Chromium	43.400	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-019	Cobalt	12.100	NA	1550.000	10.910	mg/kg	0.0	0.5	SW-846 6200
BV53-019	Iron	38800.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-019	Nickel	51.400	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-019	Strontium	177.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-019	Vanadium	87.400	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-019	Zinc	80.100	NA	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-052	Antimony	1.900	NA	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BV53-052	Copper	250.000	NA	40900.000	18.060	mg/kg	0.0	0.3	SW-846 6010
BV53-052	Lead	290.000	NA	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-053	Antimony	1.400	NA	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BV53-053	Copper	48.000	NA	40900.000	18.060	mg/kg	0.0	0.3	SW-846 6010
BV53-053	Lead	210.000	NA	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-012	Aluminum	18000.000	NA	228000.000	16902.000	mg/kg	0.0	0.5	SW-846 6010
BV53-012	Antimony	0.670	NA	409.000	0.470	mg/kg	0.0	0.5	SW-846 6010
BV53-012	Beryllium	0.980	NA	921.000	0.966	mg/kg	0.0	0.5	SW-846 6010
BV53-012	Copper	21.000	NA	40900.000	18.060	mg/kg	0.0	0.5	SW-846 6010
BV53-012	Lead	120.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-054	Aluminum	17000.000	NA	228000.000	16902.000	mg/kg	0.0	0.3	SW-846 6010
BV53-054	Antimony	3.400	NA	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BV53-054	Chromium	19.000	NA	268.000	16.990	mg/kg	0.0	0.3	SW-846 6010
BV53-054	Copper	140.000	NA	40900.000	18.060	mg/kg	0.0	0.3	SW-846 6010
BV53-054	Lead	520.000	NA	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010
BV53-054	Nickel	16.000	NA	20400.000	14.910	mg/kg	0.0	0.3	SW-846 6010

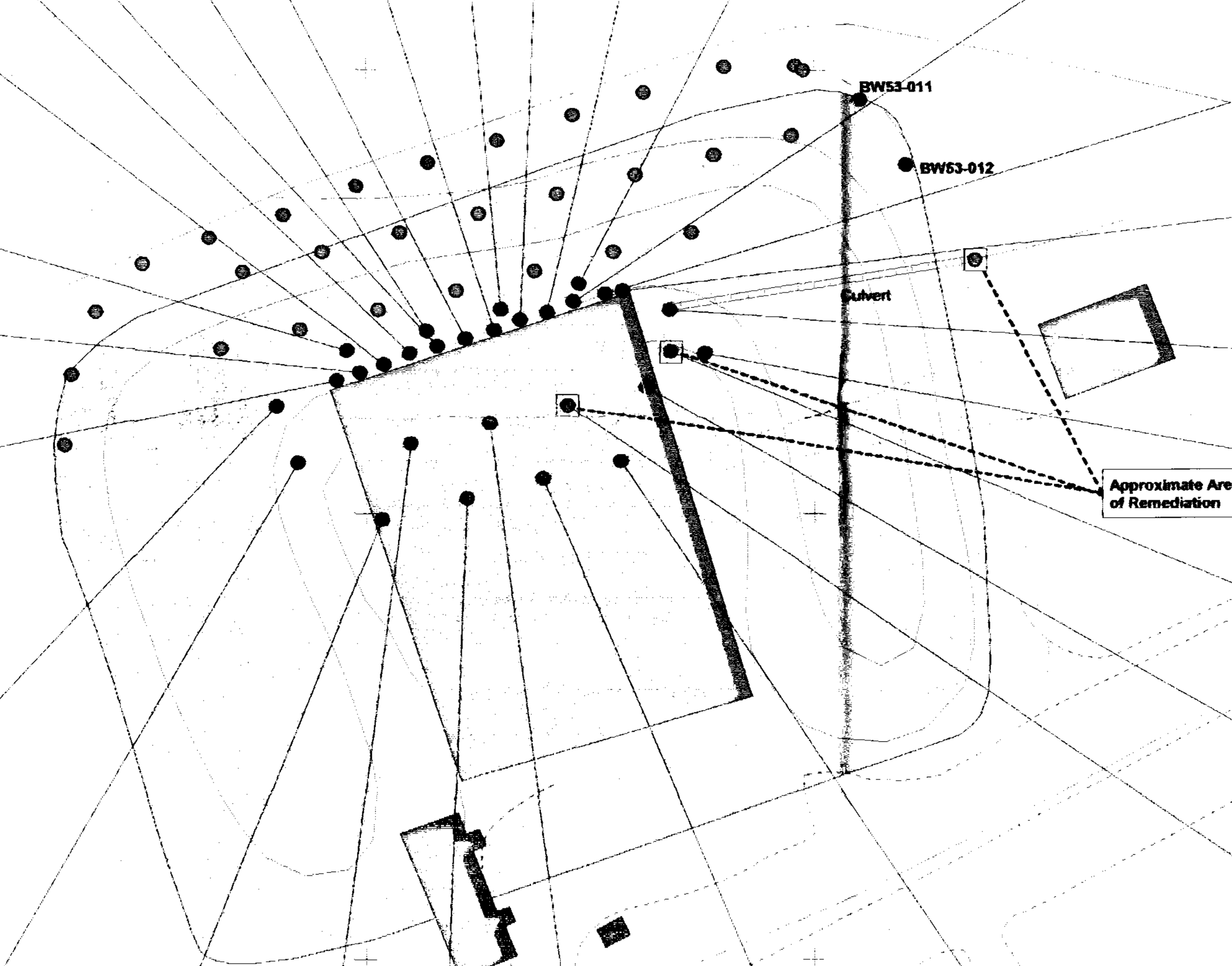
Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-018	Antimony	22.400	NA	409.000	0.470	mg/kg	0.0	0.5	SW-846 6200
BV53-018	Arsenic	75.800	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-018	Barium	726.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-018	Chromium	43.000	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-018	Cobalt	11.400	NA	1550.000	10.910	mg/kg	0.0	0.5	SW-846 6200
BV53-018	Iron	36100.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-018	Lead	590.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-018	Nickel	48.800	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-018	Selenium	1.940	NA	5110.000	1.224	mg/kg	0.0	0.5	SW-846 6200
BV53-018	Strontium	168.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-018	Vanadium	90.600	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-018	Zinc	113.000	NA	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-016	Antimony	18.700	NA	409.000	0.470	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Arsenic	52.000	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Barium	752.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Chromium	43.800	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Iron	37100.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Lead	697.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Nickel	49.200	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Strontium	176.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Tin	12.200	NA	613000.000	2.900	mg/kg	0.0	0.5	SW-846 6200
BV53-016	Zinc	83.000	NA	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW53-010	Antimony	1.600	NA	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BW53-010	Copper	41.000	NA	40900.000	18.060	mg/kg	0.0	0.3	SW-846 6010
BW53-010	Lead	200.000	NA	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-017	Aluminum	22000.000	NA	228000.000	16902.000	mg/kg	0.0	0.5	SW-846 6010
BV53-017	Antimony	0.560	NA	409.000	0.470	mg/kg	0.0	0.5	SW-846 6010
BV53-017	Beryllium	1.100	NA	921.000	0.966	mg/kg	0.0	0.5	SW-846 6010
BV53-017	Chromium	18.000	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6010
BV53-017	Copper	22.000	NA	40900.000	18.060	mg/kg	0.0	0.5	SW-846 6010
BV53-017	Lead	120.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6010
BV53-017	Lithium	12.000	NA	20400.000	11.550	mg/kg	0.0	0.5	SW-846 6010
BV53-017	Nickel	15.000	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-055	Antimony	38.000	NA	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BV53-055	Arsenic	12.000	NA	22.200	10.090	mg/kg	0.0	0.3	SW-846 6010
BV53-055	Copper	5200.000	NA	40900.000	18.060	mg/kg	0.0	0.3	SW-846 6010
BV53-055	Lead	6200.000	NA	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010
BV53-055	Selenium	1.400	NA	5110.000	1.224	mg/kg	0.0	0.3	SW-846 6010
BV53-055	Tin	14.000	NA	613000.000	2.900	mg/kg	0.0	0.3	SW-846 6010
BV53-055	Zinc	430.000	NA	307000.000	73.760	mg/kg	0.0	0.3	SW-846 6010



Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-037	Barium	679.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-037	Chromium	35.900	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-037	Iron	36100.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-037	Nickel	49.100	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-037	Selenium	20.900	NA	5110.000	1.224	mg/kg	0.0	0.5	SW-846 6200
BV53-037	Vanadium	92.500	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-037	Zinc	100.000	NA	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-044	Antimony	0.920	NA	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BV53-044	Lead	88.000	NA	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-036	Antimony	27.300	NA	409.000	0.470	mg/kg	0.0	0.5	SW-846 6200
BV53-036	Arsenic	131.000	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-036	Barium	712.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-036	Chromium	42.400	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-036	Iron	35900.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-036	Lead	1680.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-036	Mercury	2.800	NA	25200.000	0.134	mg/kg	0.0	0.5	SW-846 6200
BV53-036	Nickel	42.700	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-036	Selenium	11.600	NA	5110.000	1.224	mg/kg	0.0	0.5	SW-846 6200
BV53-036	Strontium	160.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-036	Vanadium	69.500	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-045	Aluminum	17000.000	NA	228000.000	16902.000	mg/kg	0.0	0.3	SW-846 6010
BV53-045	Antimony	1.500	NA	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BV53-045	Copper	29.000	NA	40900.000	18.060	mg/kg	0.0	0.3	SW-846 6010
BV53-045	Lead	440.000	NA	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-046	Copper	26.000	NA	40900.000	18.060	mg/kg	0.0	0.3	SW-846 6010
BV53-046	Lead	68.000	NA	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-033	Arsenic	33.200	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-033	Barium	545.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-033	Chromium	21.300	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-033	Iron	19200.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-033	Lead	143.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-033	Nickel	22.900	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-033	Strontium	142.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-048	Antimony	0.750	NA	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BV53-048	Copper	34.000	NA	40900.000	18.060	mg/kg	0.0	0.3	SW-846 6010
BV53-048	Lead	210.000	NA	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-047	Antimony	1.500	NA	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010
BV53-047	Copper	20.000	NA	40900.000	18.060	mg/kg	0.0	0.3	SW-846 6010
BV53-047	Lead	650.000	NA	1000.000	54.620	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-032	Arsenic	70.600	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Barium	767.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Chromium	48.900	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Iron	37800.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Lead	562.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Nickel	47.100	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Selenium	2.660	NA	5110.000	1.224	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Strontium	168.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-032	Vanadium	88.200	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-035	Arsenic	53.500	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Barium	743.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Chromium	35.800	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Iron	38100.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Lead	190.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Nickel	48.400	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Strontium	160.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Tin	10.800	NA	613000.000	2.900	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Vanadium	101.000	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-035	Zinc	75.700	NA	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Easting grid labels: 2081000, 2081200, 2081400, 2081600, 2081800, 2082000, 2082200, 2082400, 2082600, 2082800

Northing grid labels: 752600, 752400, 752200, 752000, 751800, 751600, 751400

KEY

- Sampling location with results less than background means plus two standard deviations
- Sampling location with result greater than background means plus two standard deviations
- Sampling location with result greater than wildlife refuge worker action level
  Red font = result to be remediated
  Green font = result will not be remediated
  (see document text)
- Locations shown on Figure 3
  blue > background mean plus two standard deviations
  red > wildlife refuge worker action level
- PAC NW-1505
- Structure removed at PAC NW-1505
- Dirt road
- Stream
- Pond
- Topographic contour 5 ft

N

Scale = 1:1000

50 0 50 100 150 200 250 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared for: KAISER•HILL COMPANY

Prepared by: RADMS

File: W:\Projects\Fy2005\NE-1North_Range \nfr_cor_041305.apr

Date: 2/16/05

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BZ-A-000861

FIGURE 3

IHSS Group NE-1
PAC NW-1505
North Firing Range
Analytical Results
Greater Than Background Means Plus Two Standard Deviations (Outer)

KEY

- Sampling location with results less than background means plus two standard deviations
- Sampling location with result greater than background means plus two standard deviations
- Sampling location with result greater than wildlife refuge worker action level
  Red font = result to be remediated
  Green font = result will not be remediated (see document text)
- Locations shown on Figure 4
  blue > background mean plus two standard deviations
  red > wildlife refuge worker action level
- PAC NW-1505
- Structure removed at PAC NW-1505
- Dirt road
- Stream
- Pond
- Topographic contour 5 ft

N

Scale = 1:1000

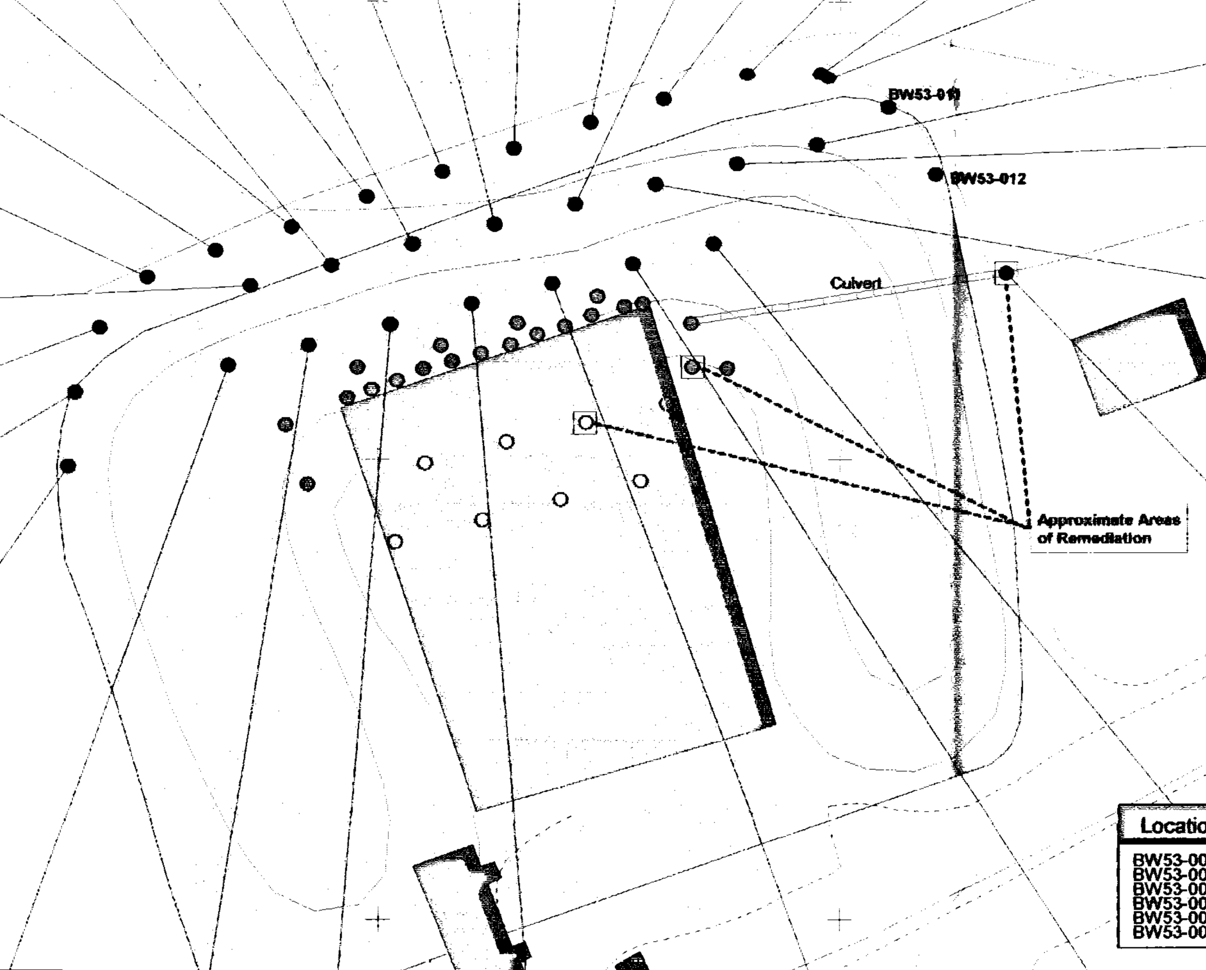
50 0 50 100 150 200 250 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared for: KAISER•HILL COMPANY

Prepared by: RADMS



Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-003	Arsenic	35.600	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-003	Barium	790.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-003	Chromium	37.500	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-003	Iron	32500.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-003	Nickel	43.100	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-003	Strontium	185.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-040	Arsenic	21.300	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-040	Barium	780.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-040	Chromium	48.700	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-040	Iron	37200.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-040	Nickel	49.000	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-040	Strontium	169.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-040	Vanadium	105.000	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-040	Arsenic	15.800	NA	22.200	13.140	mg/kg	0.5	2.5	SW-846 6200
BV53-040	Barium	590.000	NA	26400.000	289.380	mg/kg	0.5	2.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-051	Antimony	0.660	NA	409.000	0.470	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-039	Arsenic	15.500	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-039	Barium	712.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-039	Chromium	47.200	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-039	Cobalt	11.200	NA	1550.000	10.910	mg/kg	0.0	0.5	SW-846 6200
BV53-039	Iron	37500.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-039	Nickel	50.900	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-039	Strontium	164.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-039	Vanadium	83.800	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-039	Arsenic	19.900	NA	22.200	13.140	mg/kg	0.5	2.5	SW-846 6200
BV53-039	Barium	792.000	NA	26400.000	289.380	mg/kg	0.5	2.5	SW-846 6200
BV53-039	Vanadium	114.000	NA	7150.000	88.490	mg/kg	0.5	2.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-001	Arsenic	22.300	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-001	Barium	754.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-001	Chromium	35.800	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-001	Iron	35200.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-001	Nickel	44.900	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-001	Strontium	186.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-038	Arsenic	17.500	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-038	Barium	834.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-038	Chromium	38.000	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-038	Iron	36200.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-038	Nickel	44.300	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-038	Strontium	175.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-038	Vanadium	85.700	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-038	Barium	856.000	NA	26400.000	289.380	mg/kg	0.5	2.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BU53-002	Arsenic	37.900	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BU53-002	Barium	842.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BU53-002	Chromium	42.500	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BU53-002	Iron	36100.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BU53-002	Nickel	47.300	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BU53-002	Strontium	187.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BU53-002	Tin	12.900	NA	613000.000	2.900	mg/kg	0.0	0.5	SW-846 6200
BU53-002	Vanadium	82.200	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BU53-002	Barium	402.000	NA	26400.000	289.380	mg/kg	0.5	2.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BU53-001	Aluminum	18000.000	NA	228000.000	16902.000	mg/kg	0.0	0.5	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-000	Arsenic	18.600	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-000	Barium	821.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-000	Chromium	37.300	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-000	Cobalt	13.200	NA	1550.000	10.910	mg/kg	0.0	0.5	SW-846 6200
BV53-000	Iron	42100.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-000	Manganese	642.000	NA	3480.000	365.080	mg/kg	0.0	0.5	SW-846 6200
BV53-000	Nickel	58.200	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-000	Strontium	245.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-000	Vanadium	104.000	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-000	Zinc	81.800	NA	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BU53-004	Arsenic	43.200	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BU53-004	Barium	849.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BU53-004	Chromium	44.900	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BU53-004	Iron	37200.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BU53-004	Lead	69.500	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BU53-004	Manganese	452.000	NA	3480.000	365.080	mg/kg	0.0	0.5	SW-846 6200
BU53-004	Nickel	45.600	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BU53-004	Strontium	183.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BU53-004	Vanadium	92.000	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BU52-000	Barium	868.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BU52-000	Chromium	43.800	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BU52-000	Iron	38200.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BU52-000	Manganese	485.000	NA	3480.000	365.080	mg/kg	0.0	0.5	SW-846 6200
BU52-000	Nickel	47.300	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BU52-000	Strontium	180.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BU52-001	Arsenic	19.800	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BU52-001	Barium	867.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BU52-001	Chromium	60.500	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BU52-001	Iron	38000.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BU52-001	Manganese	464.000	NA	3480.000	365.080	mg/kg	0.0	0.5	SW-846 6200
BU52-001	Nickel	46.900	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BU52-001	Strontium	176.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BU52-001	Vanadium	90.800	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BU53-000	Aluminum	18000.000	NA	228000.000	16902.000	mg/kg	0.0	0.5	SW-846 6010
BU53-000	Copper	22.000	NA	40900.000	18.060	mg/kg	0.0	0.5	SW-846 6010
BU53-000	Lead	240.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6010
BU53-000	Lithium	14.000	NA	20400.000	11.550	mg/kg	0.0	0.5	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-006	Aluminum	18000.000	NA	228000.000	16902.000	mg/kg	0.0	0.5	SW-846 6010
BV53-006	Antimony	0.690	NA	409.000	0.470	mg/kg	0.0	0.5	SW-846 6010
BV53-006	Chromium	17.000	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6010
BV53-006	Copper	20.000	NA	40900.000	18.060	mg/kg	0.0	0.5	SW-846 6010
BV53-006	Lead	99.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6010
BV53-006	Nickel	15.000	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-007	Arsenic	43.900	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-007	Barium	822.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-007	Chromium	26.900	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-007	Cobalt	11.600	NA	1550.000	10.910	mg/kg	0.0	0.5	SW-846 6200
BV53-007	Iron	38700.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-007	Lead	236.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-007	Nickel	49.400	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-007	Strontium	184.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-007	Tin	11.700	NA	613000.000	2.900	mg/kg	0.0	0.5	SW-846 6200
BV53-007	Vanadium	95.400	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-041	Arsenic	24.700	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-041	Barium	958.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-041	Chromium	50.100	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-041	Cobalt	12.300	NA	1550.000	10.910	mg/kg	0.0	0.5	SW-846 6200
BV53-041	Iron	40400.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-041	Nickel	54.000	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-041	Strontium	244.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-041	Vanadium	87.200	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-041	Barium	760.000	NA	26400.000	289.380	mg/kg	0.5	2.5	SW-846 6200
BV53-041	Vanadium	91.800	NA	7150.000	88.490	mg/kg	0.5	2.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-042	Arsenic	27.300	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-042	Barium	794.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-042	Chromium	41.300	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-042	Iron	33800.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-042	Nickel	42.800	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-042	Strontium	194.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-042	Vanadium	79.800	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-042	Barium	615.000	NA	26400.000	289.380	mg/kg	0.5	2.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-004	Arsenic	27.300	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-004	Barium	765.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-004	Chromium	52.200	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-004	Iron	35900.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-004	Nickel	46.000	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-004	Strontium	183.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV54-000	Arsenic	22.400	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV54-000	Barium	742.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV54-000	Chromium	44.800	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV54-000	Iron	40300.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV54-000	Manganese	446.000	NA	3480.000	365.080	mg/kg	0.0	0.5	SW-846 6200
BV54-000	Nickel	47.500	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV54-000	Strontium	184.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV54-000	Barium	645.000	NA	26400.000	289.380	mg/kg	0.5	2.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW54-002	Arsenic	17.300	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BW54-002	Barium	781.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BW54-002	Chromium	37.600	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BW54-002	Iron	33800.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BW54-002	Manganese	501.000	NA	3480.000	365.080	mg/kg	0.0	0.5	SW-846 6200
BW54-002	Nickel	41.500	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BW54-002	Strontium	190.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BW54-002	Vanadium	101.000	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BW54-002	Arsenic	18.300	NA	22.200	13.140	mg/kg	0.5	2.5	SW-846 6200
BW54-002	Barium	852.000	NA	26400.000	289.380	mg/kg	0.5	2.5	SW-846 6200
BW54-002	Iron	42300.000	NA	307000.000	41046.520	mg/kg	0.5	2.5	SW-846 6200
BW54-002	Nickel	67.400	NA	20400.000	62.210	mg/kg	0.5	2.5	SW-846 6200
BW54-002	Vanadium	136.000	NA	7150.000	88.490	mg/kg	0.5	2.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW53-002	Arsenic	18.100	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BW53-002	Barium	798.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BW53-002	Chromium	52.400	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BW53-002	Iron	37000.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BW53-002	Manganese	451.000	NA	3480.000	365.080	mg/kg	0.0	0.5	SW-846 6200
BW53-002	Nickel	48.100	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BW53-002	Strontium	183.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BW53-002	Tin	12.200	NA	613000.000	2.900	mg/kg	0.0	0.5	SW-846 6200
BW53-002	Vanadium	94.100	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW54-003	Arsenic	16.600	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BW54-003	Barium	807.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BW54-003	Chromium	50.300	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BW54-003	Iron	35200.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BW54-003	Manganese	411.000	NA	3480.000	365.080	mg/kg	0.0	0.5	SW-846 6200
BW54-003	Nickel	44.500	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BW54-003	Strontium	169.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BW54-003	Barium	817.000	NA	26400.000	289.380	mg/kg	0.5	2.5	SW-846 6200
BW54-003	Vanadium	102.000	NA	7150.000	88.490	mg/kg	0.5	2.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW54-001	Arsenic	19.800	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BW54-001	Barium	778.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BW54-001	Chromium	45.500	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BW54-001	Iron	41800.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BW54-001	Nickel	54.400	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BW54-001	Strontium	182.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BW54-001	Vanadium	94.900	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BW54-001	Zinc	95.200	NA	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW54-004	Aluminum	18000.000	NA	228000.000	16902.000	mg/kg	0.0	0.3	SW-846 6010
BW54-004	Beryllium	0.970	NA	921.000	0.966	mg/kg	0.0	0.3	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-005	Arsenic	38.600	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-005	Barium	729.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-005	Chromium	49.200	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-005	Iron	38800.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-005	Nickel	52.700	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-005	Strontium	219.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-005	Vanadium	96.100	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200
BV53-005	Zinc	77.100	NA	307000.000	73.760	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW53-001	Antimony	16.000	NA	409.000	0.470	mg/kg	0.0	0.5	SW—846 6010
BW53-001	Arsenic	13.000	NA	22.200	10.090	mg/kg	0.0	0.5	SW—846 6010
BW53-001	Chromium	19.000	NA	268.000	16.990	mg/kg	0.0	0.5	SW—846 6010
BW53-001	Copper	1100.000	NA	40900.000	18.060	mg/kg	0.0	0.5	SW—846 6010
BW53-001	Lead	3500.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW—846 6010
BW53-001	Selenium	1.300	NA	5110.000	1.224	mg/kg	0.0	0.5	SW—846 6010
BW53-001	Tin	4.500	NA	613000.000	2.900	mg/kg	0.0	0.5	SW—846 6010
BW53-001	Zinc	720.000	NA	307000.000	73.760	mg/kg	0.0	0.5	SW—846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BW53-000	Arsenic	21.300	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BW53-000	Barium	804.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BW53-000	Chromium	38.300	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BW53-000	Iron	34300.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BW53-000	Nickel	45.500	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BW53-000	Strontium	189.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-010	Arsenic	38.400	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-010	Barium	748.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-010	Chromium	40.000	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-010	Iron	35400.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-010	Lead	122.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-010	Nickel	45.500	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-010	Strontium	173.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200
BV53-010	Vanadium	85.900	NA	7150.000	45.590	mg/kg	0.0	0.5	SW-846 6200

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-009	Aluminum	18000.000	NA	228000.000	16902.000	mg/kg	0.0	0.5	SW-846 6010
BV53-009	Antimony	0.670	NA	409.000	0.470	mg/kg	0.0	0.5	SW-846 6010
BV53-009	Beryllium	1.000	NA	921.000	0.966	mg/kg	0.0	0.5	SW-846 6010
BV53-009	Lead	110.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6010

Location	Analyte	Result	RI	Wrw al	Bk+2sd	Unit	Start depth (ft)	End depth (ft)	Method
BV53-008	Antimony	16.100	NA	409.000	0.470	mg/kg	0.0	0.5	SW-846 6200
BV53-008	Arsenic	36.600	NA	22.200	10.090	mg/kg	0.0	0.5	SW-846 6200
BV53-008	Barium	877.000	NA	26400.000	141.260	mg/kg	0.0	0.5	SW-846 6200
BV53-008	Chromium	37.400	NA	268.000	16.990	mg/kg	0.0	0.5	SW-846 6200
BV53-008	Iron	34300.000	NA	307000.000	18037.000	mg/kg	0.0	0.5	SW-846 6200
BV53-008	Lead	225.000	NA	1000.000	54.620	mg/kg	0.0	0.5	SW-846 6200
BV53-008	Nickel	46.000	NA	20400.000	14.910	mg/kg	0.0	0.5	SW-846 6200
BV53-008	Strontium	178.000	NA	613000.000	48.940	mg/kg	0.0	0.5	SW-846 6200

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